The search histories are listed at the end of this file.

EIC SEARCH

REPORT.

43/9/1 (Item 1 from file: 23)
DIALOG(R) File 23:CSA Technology Research Database

0003406798 IP ACCESSION NO: A88-30884
Dynamic theory of **picosecond** optical **pulse** shaping by gain-switched **semiconductor laser** amplifiers

SCHOELL, ECKEHARD
Aachen, Rheinisch-Westfaelische Technische Hochschule, Federal Republic of Germany [SCHOELL]

IEEE Journal of Quantum Electronics, v 24, p 435-442, Feb. 1988
PUBLICATION DATE: 1988

CONFERENCE:
, UNITED STATES

DOCUMENT TYPE: Journal Article
RECORD TYPE: Abstract
LANGUAGE: ENGLISH
ISSN: 0018-9197
NOTES: DFG-supported research
NO. OF REFS.: 20
FILE SEGMENT: Aerospace & High Technology

ABSTRACT:
A dynamic theory of **semiconductor laser** amplifiers is developed that takes into account the coherent time-dependent amplification of an incident optical **pulse** as well as the nonlinear dynamics of the **semiconductor laser** when driven by an unbiased injection-**current pulse**. For suitable time delays between the optical and the electrical **pulse**, a strongly nonlinear self-induced shortening of the emitted **laser pulse** is predicted. (I.E.)

DESCRIPTORS: *Dynamic models; ***Laser outputs**; *Optical switching; ***Picosecond pulses**; ***Semiconductor lasers**; *Ultrashort **pulsed lasers**; **Continuous wave lasers**; **Time** dependence
SUBJ CATG: 36, **LASERS** AND MASERS

43/9/3 (Item 2 from file: 350)
DIALOG(R) File 350:Derwent WPIX
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009602754
WPI Acc No: 1993-296302/199338
XRPX Acc No: N93-228388
Optical transmission equipment for non-return-to-zero modulator - incorporates **laser** diode driven by superimposed **currents** corresp. to modulating signal, DC bias **voltage** and smaller **clock** sine-wave.
Patent Assignee: TOSHIBA KK (TOKE)
Inventor: KAMINISHI K
Number of Countries: 003 Number of Patents: 004
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
DE 4305418	A1	19930916	DE 493305418	A	19930222	199338	B
JP 5244094	A	19930921	JP 9239007	A	19920226	199342	
US 5444561	**A**	**19950822**	**US 9314686**	**A**	**19930208**	**199539**	
DE 4305418	B4	20040729	DE 493305418	A	19930222	200449	

Priority Applications (No Type Date): JP 9239007 A 19920226
Abstract (Basic): DE 4305418 A

A **semiconductor laser** (LD) is **pulsed** by a **laser** driver (11) providing a **current** by superposition of an NRZ modulation signal (DT), a bias **voltage** (BS) and a clock signal (CK). An optical fibre (13) conveys the **laser** beam to a photodetector (PD), whose electrical **output** is preamplified (15) and divided between a data regenerator (17) and a clock signal extractor (16).

The **laser** driver incorporates three convertors of the respective **input** signals into proportional **currents**, and a **combiner**. The clock signal is a sinusoid with **amplitude** smaller than the DC bias **voltage**.

USE/ADVANTAGE - In UHF AM transmission at giga-bit per second rates. Simple and economical circuit structure can extract clock signal continuously without detriment to transmission signal pattern.

Abstract (Equivalent): US 5444561 A

The optical transmission appts. has an **output** device for **outputting** a **laser** light from a transmission side, the **laser** light being derived by superposing a DC bias and a clock signal on an NRZ modulation signal. The DC bias is greater than a threshold **current** of a **semiconductor laser**, and the clock signal is a **continuous wave** which has an **amplitude** smaller than a difference between the DC bias and the threshold **current** and which is synchronous with the NRZ modulation signal.

An optical fibre transmits the **laser** beam **output** from the **output** device to a reception side, and a photodetector senses the transmitted **laser** light and converts it to an electrical signal. A clock extractor obtains the clock signal, which is the **continuous wave**, from the electrical signal obtained by the photodetector. A data regenerator derives the NRZ modulation signal from the electrical signal obtained by the photodetector, in accordance with the extracted clock signal.

USE/ADVANTAGE - E.g. for telecommunications, computer links etc. Can continuously extract clock signal without being affected by transmission pattern.

43/9/4 (Item 1 from file: 2)
DIALOG(R) File 2:INSPEC

07070802 INSPEC Abstract Number: A9824-4255P-015, B9812-4320J-125
Title: Room temperature **CW** GaAs/AlGaAs vertical cavity surface emitting **semiconductor laser** fabricated by selective oxidation and selective etching
Author(s): Kang Xuejun; Lin Shiming; Gao Junhua; Gao Honghai; Wang Qiming ; Wang Hongjie; Wang Lixuan; Zhang Chunhui
Author Affiliation: Inst. of Semicond., Acad. Sinica, Beijing, China
Journal: Chinese Journal of Semiconductors vol.17, no.11 p.873-6
Publisher: Science Press,
Publication Date: Nov. 1996 Country of Publication: China
CODEN: PTTPDZ ISSN: 0253-4177
SICI: 0253-4177(199611)17:11L.873:RTGA;1-L
Material Identity Number: A658-98024
Language: Chinese Document Type: Journal Paper (JP)
Treatment: Practical (P); Experimental (X)
Abstract: We report on a GaAs/AlGaAs vertical-cavity surface-emitting **semiconductor lasers** fabricated by selective oxidation and selective etching. The **current** aperture is formed by the buried oxide layers within monolithic distributed Bragg reflectors. The lowest threshold of 3.8 mA is achieved with a 4 mu m square active region, **continuous-wave** at room temperature, the maximum **output power** is greater than 1 mW, its angle of divergence is less than 7.8 degrees and the **pulse** rise time is less than 100 **ps** when measured at high frequency. A 2*3 2-D array is obtained. (7 Refs)

43/9/5 (Item 2 from file: 2)
DIALOG(R) File 2:INSPEC

06789038 INSPEC Abstract Number: A9803-4255P-023, B9802-4320J-037
Title: VCSEL array fabricated by selective etching and selective oxidation
Author(s): Lin Shiming; Kang Xuejon; Wang Qiming; Gao Junhua; Gao Honghai ; Wang Hongjie; Wang Lixnan; Zhang Chunhui
Author Affiliation: Inst. of Semicond., Acad. Sinica, Beijing, China
Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA) vol.2886 p.10-14
Publisher: SPIE-Int. Soc. Opt. Eng,
Publication Date: 1996 *Country of Publication: USA*
CODEN: PSISDG ISSN: 0277-786X
SICI: 0277-786X(1996)2886L.10:VAFS;1-#
Material Identity Number: C574-96245
U.S. Copyright Clearance Center Code: 0 8194 2287 8/96/$6.00
Conference Title: Semiconductor Lasers II
Conference Sponsor: SPIE; China Opt. & Optelectron. Manuf. Assoc.; Chinese Opt Soc
Conference Date: 6-7 Nov. 1996 Conference Location: Beijing, China
Language: English Document Type: Conference Paper (PA); Journal Paper
Treatment: Experimental (X)
Abstract: The effects of the thickness of the oxidized layer, reaction temperature and carrier gas flow on the oxidation rate of Al/sub x/Ga/sub 1-x/As-AlAs-GaAs heterostructures are presented. The electrically-pumped GaAs/AlGaAs vertical cavity surface emitting **laser** 2D arrays fabricated by selective etching and selective oxidation are described. The square **current** flow aperture of 4*4 mu m/sup 2/ are formed by the buried oxidized AlAs layers formed on both top and bottom distributed Bragg reflectors adjacent to the active region. The serious resistance of the devices are 60-80 Omega . The **continuous-wave** threshold **current** as low as 3.8 mA is obtained at room temperature. The devices show the maximum **output power** over 1 mW. Their angles of divergence are less than 7.8 degrees and the **pulse** rise times are less than 100 **ps** in the high speed **pulse** response measurements. The 2*3 2D arrays are obtained. The thresholds of the devices in the array are within 6+or-0.5 mA. (13 Refs)
Descriptors: aluminium compounds; distributed Bragg reflector **lasers**; etching; gallium arsenide; high-speed optical techniques; III-V semiconductors; **laser** beams; **laser** cavity resonators; **laser** variables measurement; molecular beam epitaxial growth; optical fabrication; oxidation; **semiconductor laser** arrays; surface emitting **lasers**
Numerical Indexing: resistance 6.0E+01 to 9.0E+01 ohm; current 3.8E-03 A; **time 1.0E-10 s**

43/9/6 (Item 3 from file: 2)
DIALOG(R) File 2:INSPEC

05761010 INSPEC Abstract Number: A9420-4260D-017, B9410-4320L-032
Title: Compact VCSEL module with butt-coupled fibre for efficient modelocking
Author(s): Fiedler, U.; Moeller, B.; Zeeb, E.; Jung, C.; Ebeling, K.J.
Author Affiliation: Dept. of Optoelectron., Ulm Univ., Germany
Journal: Electronics Letters vol.30, no.15 p.1226-7
Publication Date: 21 July 1994 Country of Publication: UK
CODEN: ELLEAK ISSN: 0013-5194
U.S. Copyright Clearance Center Code: 0013-5194/94/$7.50+0.00
Language: English Document Type: Journal Paper (JP)
Treatment: New Developments (N); Practical (P)
Abstract: A novel compact modelocking source using an electrically pumped vertical cavity surface emitting **laser** (VCSEL) with an external fibre optic resonator is presented. **CW** threshold **current** of the modelocking configuration is as low as 1.7 mA. The **output pulse** width is 24 **ps** and the timing jitter of the **pulses** remains below 1 **ps**. (7 Refs)
Descriptors: **laser** cavity resonators; **laser** mode locking; optical fibres; **semiconductor lasers**
Identifiers: VCSEL module; butt-coupled fibre; compact modelocking source ; electrically pumped VCSEL; external fibre optic resonator; **CW** threshold **current**; **timing jitter**; vertical cavity; surface emitting **laser**; 1.7 mA; 24 **ps**
Numerical Indexing: current 1.7E-03 A; **time 2.4E-11 s**

43/9/7 (Item 4 from file: 2)
DIALOG(R) File 2:INSPEC

05192193 INSPEC Abstract Number: A9216-4260F-016, B9208-4320J-079
Title: A 1.54- mu m monolithic **semiconductor** ring **laser**: **CW** and mode-locked operation
Author(s): Hansen, P.B.; Raybon, G.; Chien, M.-D.; Koren, U.; Miller, B.I.; Young, M.G.; Verdiell, J.-M.; Burrus, C.A.
Author Affiliation: AT&T Bell Lab., Holmdel, NJ, USA
Journal: IEEE Photonics Technology Letters vol.4, no.5 p.411-13
Publication Date: May 1992 Country of Publication: USA
CODEN: IPTLEL ISSN: 1041-1135
U.S. Copyright Clearance Center Code: 1041-1135/92/$03.00
Language: English Document Type: Journal Paper (JP)
Treatment: Experimental (X)
Abstract: The authors have fabricated a monolithic **semiconductor** ring **laser** with a diameter of 3.0 mm. A straight tangent waveguide provides two **output** ports through evanescent coupling. The **laser**, which exhibits a threshold **current** of 157 mA, operates in a single longitudinal mode with a linewidth of 900 kHz at a wavelength of 1.54 mu m. The device has been actively mode-locked at the fundamental resonance frequency of 9.0 GHz, yielding 27-**ps pulses** with a time-bandwidth product of 0.47. Differences in the characteristics of the **pulses** emitted from the two **output** ports indicate counterpropagating **pulse** trains, which because of the mode-locking scheme must collide in the modulated gain section. (5 Refs)
Subfile: A B
Descriptors: **laser** mode locking; optical modulation; ring **lasers**; **semiconductor** junction **lasers**; spectral line breadth
Identifiers: IR; colliding **laser pulses**; diode **lasers**; monolithic **semiconductor** ring **laser**; mode-locked operation; straight tangent waveguide; **output** ports; evanescent coupling; threshold **current**; single longitudinal mode; linewidth; actively mode-locked; fundamental resonance frequency; **time**-bandwidth product; counterpropagating **pulse** trains; modulated gain section; 1.54 micron; 3 mm; 157 mA; 9 GHz; 27 **ps**
Numerical Indexing: wavelength 1.54E-06 m; size 3.0E-03 m; current 1.57E-01 A; frequency 9.0E+09 Hz; **time 2.7E-11 s**

43/9/8 (Item 5 from file: 2)
DIALOG(R) File 2:INSPEC

02968187 INSPEC Abstract Number: A82114290, B83002253
Title: Optically pumped **semiconductor** platelet **lasers**
Author(s): Roxlo, C.B.; Putnam, R.S.; Salour, M.M.
Author Affiliation: MIT, Cambridge, MA, USA
Journal: Proceedings of the SPIE - The International Society for Optical Engineering vol.322 p.31-6
Publication Date: 1982 Country of Publication: USA
CODEN: PSISDG ISSN: 0277-786X
Conference Title: Picosecond Lasers and Applications
Conference Date: 26-27 Jan. 1982 Conference Location: Los Angeles, CA,
Language: English Document Type: Conference Paper (PA); Journal Paper
Treatment: Practical (P); Experimental (X)
Abstract: Tunable **CW laser** action of platelet **semiconductors** is reported in both mode-locked and unmode-locked configurations. The gain media are platelets of CdS, CdSe, CdSSe and InGaAsP, cooled to 85K and longitudinally pumped by argon-ion and krypton-ion **lasers** . Anti-reflection coating of the crystal face and external bandwidth restriction have been used to generate **pulses** as short as 4 **ps** in CdS. The **pulses** observed are chirped, with non-transform limited time-bandwidth products of about 1.7. The energy conversion efficiency is 20% into the TEM mode, with **output** powers of over 10 mW from n into the TEM/sub oo/ mode, with **output** powers of over 10 mW from CdS. **Pulses** as short as 7 **ps** tunable over a 26 nm range have been obtained in InGaAsP. (17 Refs)

43/9/9 (Item 6 from file: 2)
DIALOG(R) File 2:INSPEC

02866111 INSPEC Abstract Number: A82055191, B82031013
Title: Optically pumped **semiconductor** platelet **lasers**
Author(s): Roxlo, C.B.; Putnam, R.S.; Salour, M.M.
Author Affiliation: Exxon Corporate Res. Labs., Linden, NJ, USA
Journal: IEEE Journal of Quantum Electronics vol.QE-18, no.3 p. 338-42
Publication Date: March 1982 Country of Publication: USA
CODEN: IEJQA7 ISSN: 0018-9197
Language: English Document Type: Journal Paper (JP)
Treatment: Experimental (X)
Abstract: Tunable **CW laser** action of platelet **semiconductors** is reported in both mode-locked and unmode-locked configurations. The gain media are platelets of CdS, CdSe, CdSSe, and InGaAsP cooled to 85K and longitudinally pumped by an argon-ion **laser**. Antireflection (AR) coating of the crystal face and external bandwidth restriction have been used to generate **pulses** as short as 4 **ps**. The **pulses** observed are chirped, with nontransform limited time-bandwidth products of about 1.7. The energy conversion efficiency is 20 percent into the TEM/sub 00/ mode, with **output** powers of over 10 mW from CdS. (21 Refs)
Identifiers: optical pumping; tunable **CW laser** action; mode locked configurations; CdS platelets; CdSe platelets; CdSSe platelets; InGaAsP platelets; Ar ion **laser** pumping; antireflection coating; **pulse** generation; 4 **picosecond pulse** generation; II-**VI** semiconductors; III-V semiconductors; **semiconductor** platelet **lasers**; unmode-locked configurations; gain media; longitudinally pumped; crystal face; external bandwidth restriction; chirped; nontransform limited **time**-bandwidth products; energy conversion efficiency; TEM/sub 00/ mode; **output** powers

43/9/10 (Item 1 from file: 8)
DIALOG(R) File 8:Ei Compendex(R)

03023292 E.I. Monthly No: EIM9102-005949
Title: Single-frequency diode-pumped **lasers** for free-space communication.
Author: Kane, Thomas J.; Cheng, Emily A. P.; Gerstenberger, David C.; Wallace, Richard W.
Corporate Source: Lightwave Electronics Corp, Mountain View, Ca, USA
Conference Title: Free-Space Laser Communication Technologies II
Conference Location: Los Angeles, CA, USA Conference Date: 19900115
Sponsor: SPIE
Source: Proceedings of SPIE - The International Society for Optical Engineering v 1218. Publ by Int Soc for Optical Engineering, Bellingham, WA, USA. p 239-249
Publication Year: 1990
CODEN: PSISDG ISSN: 0277-786X ISBN: 0-8194-0259-1
Abstract: **Laser**-diode pumping of monolithic ND:YAG rings can lead to **output** powers of hundreds of milliwatts from a single **laser**. We have built several **lasers** with diffraction-limited single-mode **output** of 380 mW. These **lasers** can be injection-locked in a chain configuration to sum their **power**, while maintaining diffraction-limited, single-frequency operation. We demonstrated this chaining technique with two **lasers**, with a total **output** of 340 mW, and expect that it is practical for up to about ten **lasers**. Thus with **lasers** of 380 mW, **output** of 3 Watts is possible. The chaining technique, if properly engineered, results in redundancy. Monolithic, diode-pumped Nd:YAG ring **lasers** can provide narrow-linewidth, tunable **output** which is adequate for use as a local oscillator in a coherent communication system. We build a commerical **laser** which has a linewidth of about 2 kHz, a **power** of 5 milliwatts, and which is tunable over a range of 30 MHz in a few microseconds. We phase-locked one of these **lasers** to a second, similar **laser**. This demonstrates that the powerful technique of heterodyne detection is possible with a diode-pumped **laser** used as a local oscillator. A key to the usefulness of these **lasers** in space communication is modulation. We have experimented with a technique for converting the **cw**, infrared **output** of these **lasers** into randomly **pulsed**, green **output** useful for **Pulse**-Position Modulation. Energy storage in an external resonant cavity permits **peak** green **output** to be much more powerful than **cw** infrared **input**. We have also begun experimentation with techniques for phase and **amplitude** modulating the **output** of these **lasers**. We are taking advantage of the coherence of the **output** in order to reduce the **voltage** required for conventional electro-optic modulation. (Author abstract) 8 Refs.
Descriptors: *OPTICAL COMMUNICATION--*Space Applications; **LASERS, SEMICONDUCTOR**--Optical Pumping; **SEMICONDUCTOR** DIODES; **LASERS**, RING; **PULSE TIME** MODULATION

43/9/11 (Item 1 from file: 103)
DIALOG(R) File 103:Energy SciTec

00970068 EDB-82-144923
Title: High **peak power picosecond** light **pulses** from a directly modulated **semiconductor laser**
Author(s): Klein, H.; Bimberg, D.; Beneking, H.; Kuhl, J.; Goebel, E.O.
Affiliation: Institut fuer Halbleitertechnik und SFB 202, Rheinisch-Westfalische Technische Hochschule Aachen, Templergraben 55, D-5100 Aachen, Federal Republic of Germany and Institut fuer Festkoerperphysik der T.U.Berlin, Stra e des 17. Juni 135, D-1000 Berlin 12, Federal Republic of Germany
Source: Appl. Phys. Lett. (United States) v 41:5. Coden: APPLA
Publication Date: 1 Sep 1982
p 394-396
Document Type: Journal Article; Numerical data
Language: English
Journal Announcement: EDB8208
Country of Origin: Germany, Federal Republic of
Abstract: We report the generation of short light **pulses** of 23-**ps** duration from an unbiased proton implanted double heterostructure **cw laser** by direct gain modulation. Repetition frequencies up to 10 MHz and a typical **peak power** of 300 mW are achieved. The time behavior of the light **output** is largely independent of the rise and fall time of the modulation **current**, since the first relaxation oscillation of the **laser** is utilized.;
Major Descriptors: ***SEMICONDUCTOR LASERS** -- **PULSES**
Descriptors: ELECTRIC **CURRENTS**; EXPERIMENTAL DATA; GAIN; HETEROJUNCTIONS; ION IMPLANTATION; MHZ RANGE; MODULATION; OSCILLATIONS; **POWER**; PROTONS; **PULSE** RISE **TIME**; RELAXATION; **TIME** DEPENDENCE; VISIBLE RADIATION
Broader Terms: AMPLIFICATION; BARYONS; **CURRENTS**; DATA; **TIMING** PROPERTIES

L41 **ANSWER** 1 OF 12 HCAPLUS COPYRIGHT ACS on STN
AN 2001:656000 HCAPLUS
ED Entered STN: 07 Sep 2001
TI Cavity-augmented frequency tripling of a **continuous wave** mode-locked **laser**
AU McConnell, Gail; Ferguson, Allister I.; Langford, Nigel
CS Department of Physics and Applied Physics, University of Strathclyde, Glasgow, G4 0NG, UK
SO Journal of Physics D: Applied Physics (2001), 34(16), 2408-2413
CODEN: JPAPBE; ISSN: 0022-3727
PB Institute of Physics Publishing
DT Journal
LA English
AB We present a model and exptl. investigation of a singly-resonant optical cavity to enhance the nonlinear conversion efficiency of a **continuous wave** mode-locked all-solid-state **laser** source to produce an efficient source of UV radiation. For **input pulses** of approx. **33 ps duration** at 4.4 **ns** intervals, our model predicts greater than 30% conversion from fundamental to third harmonic which is particularly attractive for fundamental sources of modest av. power. Exptl., we have achieved overall optical conversion efficiencies from fundamental to third harmonic wavelength typically greater than 11%, compared with less than 0.4% in a single pass geometry. We have measured an av. power of 320 mW at .lambda. = 355 nm at picosecond pulse duration, which corresponds to a generated third harmonic av. power of 0.5 W.
RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Ashkin, A; IEEE J Quantum Electron 1966, V2, P109 HCAPLUS
(2) Ghosh, G; J Appl Phys 1995, V78, P6752 HCAPLUS
(3) Graf, T; Opt Commun 1999, V159, P84 HCAPLUS
(4) Hansch, T; Opt Commun 1980, V35, P441 HCAPLUS
(5) Koch, K; J Opt Soc Am B 1999, V16, P448 HCAPLUS
(6) Persaud, M; IEEE J Quantum Electron 1990, V26, P1253 HCAPLUS
(7) Sala, K; IEEE J Quantum Electron 1980, V16, P990
(8) Zhang, T; IEEE J Quantum Electron 1996, V32, P127 HCAPLUS

L41 ANSWER 4 OF 12 HCAPLUS COPYRIGHT ACS on STN

AN 1997:216179 HCAPLUS

DN 126:323026

ED Entered STN: 03 Apr 1997

TI Picosecond Nd:YLF **laser**-multipass amplifier source pumped by pulsed **diodes** for the operation of powerful OPOs

AU Heinz, P.; Seilmeier, A.; Piskarskas, A.

CS Physikalisches Inst., Univ. Bayreuth, Bayreuth, D-95440, Germany

SO Optics Communications (1997), 136(5,6), 433-436
CODEN: OPCOB8; ISSN: 0030-4018

PB Elsevier

DT Journal

LA English

CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

AB Picosecond pulse trains from a quasi **continuous-wave** Nd:YlF oscillator are amplified by a multipass system pumped by a pulsed 100 W peak power **laser diode.** Gain factors in the order of 100 are achieved with **input pulses** of 100 nJ energy and **2 ps duration.** The **high power** of the amplified pulse trains allows the operation of a quasi-**cw** synchronously pumped KTP optical parametric oscillator (OPO) at high output coupling. Pumping by the 2nd harmonic provides OPO pulses of 2.1 ps duration in trains consisting of 25 pulses with a noteworthy flat top of the envelope. The conversion efficiency of 13% corresponds to a total energy of 50 .mu.J in the trains. The parameters promise wide applications of the system in ultrafast spectroscopy.

ST neodymium doped yttrium lithium fluoride amplifier; **laser diode** pumped yttrium lithium fluoride; potassium titanyl phosphate optical parametric oscillator

IT Optical parametric oscillators
Solid state **lasers**
(**diode**-pumped Nd:YLF multipass amplifier for operation of powerful KTP optical parametric oscillator)

IT Second-harmonic generation
(frequency doubled **diode**-pumped Nd:YLF multipass amplifier for operation of powerful KTP optical parametric oscillator)

IT **Laser** radiation
(pulsed; frequency doubled **diode**-pumped Nd:YLF multipass amplifier for operation of powerful KTP optical parametric oscillator)

IT 12690-20-9, Potassium titanyl phosphate 23108-36-3, YLF
RL: DEV (Device component use); USES (Uses)
(**diode**-pumped Nd:YLF multipass amplifier for operation of powerful KTP optical parametric oscillator)

IT 7440-00-8, Neodymium, uses
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(**diode**-pumped Nd:YLF multipass amplifier for operation of powerful KTP optical parametric oscillator)

L56 ANSWER 8 OF 14 HCAPLUS COPYRIGHT ACS on STN

AN 1986:78776 HCAPLUS

DN 104:78776

ED Entered STN: 08 Mar 1986

TI Spectral and temporal study of picosecond-pulse propagation in a single-**mode** optical fiber

AU Gomes, A. S. L.; Sibbett, W.; Taylor, J. R.

CS Blackett Lab., Imp. Coll., London, SW7 2BZ, UK

SO Applied Physics B: Photophysics and Laser Chemistry (1986), B39(1), 43-46
CODEN: APPCDL; ISSN: 0721-7269

DT Journal

LA English

CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

AB The **power**-dependent **pulsewidth** variations for **input 85 ps pulses** from a **continuous wave mode**-locked Nd:YAG laser propagating through 125 m of single-**mode** optical fiber were examd. using a Synchroscan streak camera. Simultaneous spectral and temporal measurements provided information as to the optimum **parameters** for pulse compression in fibers.

ST laser pulse propagation fiber optics

IT Laser radiation
(pulsed, ps, in single-**mode** optical fiber)

IT Fiber optics
(single-**mode**, laser ps pulse propagation in)

IT Cameras
(streak, laser ps pulse propagation in single-**mode** optical fiber examd. by Synchroscan)

L64 ANSWER 2 OF 2 HCAPLUS COPYRIGHT ACS on STN
AN 2000:377720 HCAPLUS
DN 133:96259
ED Entered STN: 07 Jun 2000
TI Time-resolved transport in conjugated polymers
AU Pinner, D. J.; Friend, R. H.; Tessler, N.
CS Cambridge Laboratory, University of Cambridge, Cambridge, CB3 0HE, UK
SO Synthetic Metals (2000), 111-112, 257-261
CODEN: SYMEDZ; ISSN: 0379-6779
PB Elsevier Science S.A.
DT Journal
LA English
CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 36, 76
AB The authors present a range of measurement techniques (time-resolved and **CW**) of various polymers in a variety of LED configurations. Using **time**-resolved **pulsed** elec. excitation, the authors are able to provide direct evidence for the motion of both types of carriers. The authors use pulses to probe the decay of carriers on time scales from nanosecond to millisecond. The authors address the issue of pulsed vs. **Continuous-wave** properties and find that the functional form (power law) of the **current-voltage** curves is affected by the measurement technique; the authors also discuss a method to produce intrinsic curves. The authors introduce the method of using double elec. pulses to probe the dynamics of the stored charges after the **application** of a **pulse**.

63/9/5 (Item 1 from file: 23)
DIALOG(R) File 23:CSA Technology Research Database

0005934054 IP ACCESSION NO: A00-35305
Mass modeling for electrically powered space-based Yb:**YAG lasers**
Fitzgerald, Kevin F; Leshner, Richard B; Winsor, Harry V
Analytic Services, Inc., Arlington, VA [Fitzgerald
PAGES: 251-262
PUBLICATION DATE: 2000
PUBLISHER: Bellingham, WA: Society of Photo-Optical Instrumentation Engineers (SPIE Proceedings. Vol. 3931)
CONFERENCE:
Gas, chemical, and electrical lasers and intense beam control and applications; Proceedings of the Conference, San Jose, CA, UNITED STATES, 24-25 Jan. 2000
DOCUMENT TYPE: Conference Paper
ABSTRACT:
An estimate for the mass of a nominal high-energy **laser** system envisioned for space applications is presented. The approach features a **diode** pumped solid state **laser** (DPSSL) based on the Yb: **YAG** system with 10 MW average output power, and periods of up to 100 sec **CW** full-power operation without refueling. The system is powered by Li-ion batteries recharged by a solar array. The power requirements for this system dominate over any fixed structural features, so the critical issues in scaling a DPSSL to high power are made transparent. When based on currently available space-qualified batteries, the design mass is about 500 **metric** tons. Therefore, innovations are required before high power electrical **lasers** will be serious contenders for use in space systems. The necessary innovations must improve the rate at which Li-ion batteries output power. This analysis also finds that heating of the solid state lasing material, cooling of the **diode** pump **lasers** and **duty cycle** are critical issues. Features dominating the thermal control requirements are the heat capacity of **garnet**, the operational temperature range of the system, and the required cooling time between periods of full operation. The **duty cycle** is a critical factor in determining both the mass of the **diode** array needed, and the mass of the power supply system. (Author)

DESCRIPTORS: *Spaceborne **lasers**; *Electric power; ***Laser** outputs; ***Yag lasers**; *Ytterbium; *High power **lasers**; Solid state **lasers**; Mathematical models; Mass distribution; **Diodes**
SUBJ CATG: 36, **LASERS** AND MASERS

63/9/6 (Item 2 from file: 23)
DIALOG(R) File 23:CSA Technology Research Database

0004407249 IP ACCESSION NO: N93-15685
Picosecond optical mixing in photorefractive materials (Final Report, 1991 -1992)

MCCARTNEY, C A
Naval Academy, Annapolis, MD.
PUBLICATION DATE: 1992

CONFERENCE:
, UNITED STATES

DOCUMENT TYPE: Report
RECORD TYPE: Abstract
LANGUAGE: ENGLISH
REPORT NO: AD-A256824; USNA-TSPR-189
NOTES: CASI HC A04/MF A01; Available from CASI HC A04/MF A01
FILE SEGMENT: Aerospace & High Technology

ABSTRACT:
The interaction of **laser** light in a photorefractive crystal can form a grating that holds promise as a future means of information storage and optical processing. The goal of the project was to examine grating formation when the **laser** light consists of pulses of a few picoseconds duration and make a comparison with **continuous wave laser** light. Toward this end, a device called an optical autocorrelator was constructed to measure the duration of the **ultrashort** pulses, as they are too brief to be measured by conventional electronic means. Two measurable consequences of the photorefractive effect were examined: beam fanning and self-pumped phase conjugation. Significant differences between **pulsed** and **continuous wave input** were noted, and insight into self pumped phase conjugation was gained. The results indicate the response of photorefractive crystals to **ultrashort laser** pulses remains an attractive item of study. (GRA)

DESCRIPTORS: ***Continuous wave lasers***; ***Laser*** beams; ***Laser*** outputs; *Optical data storage materials; *Optical materials ; *Pulsed **lasers**; *Refraction; Continuous radiation; Crystals; Light beams; Nonlinear systems; Optical memory (data storage); Phase conjugation
SUBJ CATG: 36, **LASERS** AND MASERS

63/9/8 (Item 2 from file: 2)
DIALOG(R) File 2:INSPEC

06101745 INSPEC Abstract Number: A9524-4255R-003, B9512-4320G-021
Title: **Diode** pumped Nd/sup 3+/:GdVO/sub 4/ **laser** with fibre **input**
Author(s): Vlasenko, O.A.; Zavartsev, Y.D.; Zagumennyi, A.I.; Kozlov, V.A.; Studenikin, P.A.; Ter-Mikirtychev, V.V.; Shcherbakov, I.A.
Author Affiliation: Inst. of Gen. Phys., Acad. of Sci., Moscow, Russia
Journal: Kvantovaya Elektronika, Moskva vol.25, no.8 p.788-90
PUBLICATION DATE: Aug. 1995 Country of Publication: Russia
CODEN: KVEKA3 ISSN: 0368-7147
Translated in: Quantum Electronics vol.25, no.8 p.758-9
PUBLICATION DATE: Aug. 1995 Country of Publication: UK
CODEN: QUELEZ ISSN: 1063-7818
Language: English Document Type: Journal Paper (JP)
Treatment: Experimental (X)
ABSTRACT: A single-mode Nd/sup 3+/:GdVO/sub 4/ **laser** (lambda =1.06 mu m) with **diode** pumping (lambda =10.81 mu m) and fibre **input** was constructed. It could be operated in the **cw** regime and in a regime of passive Q switching of the cavity. A technology was developed for coupling the radiation of **laser diodes** into fibre waveguides with an efficiency up to 93%. Without focusing of the pump radiation (of 175 mW power), the output **power** and the lasing **threshold** obtained for a hemispherical cavity 10 cm long were 38 and 15 mW, respectively. When the **laser** was passively Q switched by an LiF:F/sub 2//sup -/ crystal, the output was pulse-periodic: the pulse duration was 15-100 **ns**, the repetition frequency was 5-200 kHz, and the **peak power** was 10 W. (3 Refs)
Subfile: A B
Descriptors: gadolinium compounds; **laser** cavity resonators; **laser** modes; **laser** transitions; neodymium; optical fibres; optical pumping; Q-switching; solid **lasers**

63/9/9 (Item 3 from file: 2)
DIALOG(R) File 2:INSPEC

05403995 INSPEC Abstract Number: A9312-4255P-011, B9306-4320J-081
Title: Multisection travelling wave semiconductor **laser** amplifiers: analysis and optimisation
Author(s): Paradisi, A.; Goano, M.; Montrosset, I.
Author Affiliation: Dipartimento di Elettronica, Politecnico di Torino, Italy
Journal: Proceedings of the SPIE - The International Society for Optical Engineering vol.1787 p.164-73
PUBLICATION DATE: 1992 Country of Publication: USA
CODEN: PSISDG ISSN: 0277-786X
U.S. Copyright Clearance Center Code: 0 8194 0966 9/92/$4.00
Conference Title: Multigigabit Fiber Communications
Conference Sponsor: SPIE
Conference Date: 8-9 Sept. 1992 Conference Location: Boston, MA, USA
Language: English Document Type: Conference Paper (PA); Journal Paper (JP)
Treatment: Theoretical (T)
ABSTRACT: With respect to homogeneously pumped **laser** amplifiers, multi-section structures for travelling wave amplifiers (MS-TWA) seem to be attractive from the point of view of both the adjustable parameters (electrical pumping of each section) and the device performances in terms of gain saturation characteristics and four-wave mixing. The authors consider the possibility of optimising 1.55 mu m MS-TWA with respect to the length and the electrical injection level of each homogeneously pumped region and to the input signal wavelength. The optimisation is accomplished by taking into account the **continuous-wave** gain-output **power characteristics** and the thermal effects within the device. The analysis of the transient behavior shows that optical **input pulses** can undergo considerable amplitude distortion, if the amplifier is not properly designed. (18 Refs)

63/9/14 (Item 1 from file: 8)
DIALOG(R) File 8:Ei Compendex(R)

06267015 E.I. No: EIP03027316544
Title: Effect of nonlinear index evolution into EDFAs on **ultra-short** pulse propagation
Author: Poti, Luca; Bogoni, Antonella
Corporate Source: CNIT Photonics Network Nat'l Lab, 56124 Pisa, Italy
Conference Title: 2002 IEEE/LEOS Annual Meeting Conference Proceedings: 15th Annual Meeting of the IEEE Lasers and Electro-Optics Society
Conference Location: Glasgow, United Kingdom Conference Date: 20021110-20021114
Sponsor: IEEE
E.I. Conference No.: 60523
Source: Conference Proceedings - Lasers and Electro-Optics Society Annual Meeting-LEOS v 2 2002. p 434-435
PUBLICATION YEAR: 2002
CODEN: CPLSE4 ISSN: 1092-8081
Language: English
Document Type: CA; (Conference Article) Treatment: T; (Theoretical)
Journal Announcement: 0301W3
ABSTRACT: The relationship between the nonlinear doped fiber coefficient and the population inversion was examined. It was found that as the pulse becomes shorter and powerful, the shape distortion increase. For a **4 ps pulse** with an **input** mean **power** of -20 dBm, an error of more than 15% was calculated. (Edited abstract) 5 Refs.
Descriptors: *Fiber **lasers**; Nonlinear optics; **Ultrashort** pulses; Light propagation; Optical fibers; **Continuous wave lasers**; **Laser** beams; Refractive index; Light absorption; Light emission; Optical Kerr effect; Mathematical transformations; Mathematical models

63/9/19 (Item 3 from file: 34)
DIALOG(R) File 34:SciSearch(R) Cited Ref Sci

00812072 Genuine Article#: EY439 Number of References: 24
Title: GAIN SATURATION CHARACTERISTICS OF TRAVELING-WAVE SEMICONDUCTOR-**LASER** AMPLIFIERS IN SHORT OPTICAL PULSE AMPLIFICATION
Author(s): SAITOH T; MUKAI T
Corporate Source: NIPPON TELEGRAPH & TEL PUBL CORP,MUSASHINO ELECT COMMUN LAB,BASIC RES LABS/MUSASHINO/TOKYO 180/JAPAN/
Journal: IEEE JOURNAL OF QUANTUM ELECTRONICS, **1990**, V26, N12, P2086-2094
Language: ENGLISH Document Type: ARTICLE
Geographic Location: JAPAN
Subfile: SciSearch; CC PHYS--Current Contents, Physical, Chemical & Earth Sciences; CC ENGI--Current Contents, Engineering, Technology & Applied Sciences
Journal Subject Category: ENGINEERING, ELECTRICAL & ELECTRONIC; PHYSICS, APPLIED

ABSTRACT: The gain saturation characteristics of traveling-wave semiconductor **laser** amplifiers (TWA's) are theoretically and experimentally investigated. In the amplification of an isolated pulse whose repetition period is short compared to the carrier lifetime, the gain saturation is related through the carrier lifetime to the gain saturation in **CW** amplification. The saturation energy is given as the output pulse energy at which the pulse energy gain is reduced by 2.35 dB from the unsaturated value, while the signal gain in **CW** amplification is decreased by 4.34 dB from the unsaturated value when the output signal intensity is equal to the saturation intensity. When the output pulse energy is smaller than the saturation energy, short optical pulses can be amplified without pulse shape distortion, whereas high-energy pulses suffer from pulse shape distortion due to the temporal gain variation during the pulse duration. FWHM pulse duration variation in amplification by TWA's depends on the **input pulse** shape. The **pulse** energy gain saturation is experimentally confirmed to be independent of pulse durations and to be determined only by the pulse energy. When the pulse repetition period becomes comparable to or smaller than the carrier lifetime, the initial gain becomes smaller than the unsaturated gain value. In extremely high repetition rate pulse amplification, the saturation of the pulse energy gain is determined by the average signal **power**. If the **input pulse** energy and the repetition rate are suitably designed, TWA's can amplify ultrahigh-speed signals because they have a wide gain bandwidth.

Identifiers--KeyWords Plus: FM QUANTUM NOISE; FIBER TRANSMISSION; **SUBPICOSECOND; COMPRESSION;** AM

63/9/20 (Item 1 from file: 35)
DIALOG(R) File 35:Dissertation Abs Online

01125159 ORDER NO: AAD90-30891
SEMICONDUCTOR **LASER** ARRAY-PUMPED, NEODYMIUM GLASS, MODELOCKED **LASER** OSCILLATOR AND REGENERATIVE AMPLIFIER
Author: DIMMICK, TIMOTHY EUGENE
Degree: PH.D.
Year: 1990
Corporate Source/Institution: UNIVERSITY OF MARYLAND (0117)
Director: PING-TONG HO
Source: VOLUME 51/05-B OF DISSERTATION ABSTRACTS INTERNATIONAL.
PAGE 2520. 129 PAGES
Descriptors: ENGINEERING, ELECTRONICS AND ELECTRICAL; PHYSICS, OPTICS
Descriptor Codes: 0544; 0752

A semiconductor-**laser**-array-pumped **cw** modelocked Nd:glass **laser** oscillator and regenerative amplifier system is described. The difficulties associated with semiconductor **laser** pumping of Nd:glass are discussed. Pump beam shaping techniques are presented which reduce thermally induced distortions of the lasing mode within the Nd:glass gain medium. A resonator design is presented which allows the use of low f# pump beam focusing optics yet provides excellent immunity to thermal lensing within the Nd:glass. The effect of thermal lensing on the resonator mode is studied. The output versus **input power** relation for the oscillator is **derived**. From measurements of the **laser threshold** versus the output coupler reflectivity, the parasitic resonator loss, unsaturated gain as a function of pump power and the optimum output coupler reflectivity are determined. Measurements of the effect of intracavity etalons on the **cw** lasing spectrum as well as the absence of cavity beat notes over a wide frequency range indicate that gain broadening over the band widths considered is predominantly homogeneous. Good agreement is found between theory and experiment assuming a homogeneously broadened line. The **cw** modelocked Nd:glass **laser** oscillator produced optical pulses ranging from 20 to 90 **ps** in width at average powers of 20 to 50 mW.

The design and operation of the semiconductor **laser** array pumped Nd:glass regenerative amplifier is presented. Techniques for measurement of the time dependent resonator transmission as well as the output pulse energy are described. The amplifier's performance is consistent with predictions based on published theory and measured parameters. The regenerative amplifier, when used in conjunction with the modelocked oscillator, provided an energy amplification greater than 50 dB producing 4.7 μJ, 77 kW **peak power** pulses at a repetition rate of 355 Hz. This represents the largest **peak power** obtained to date from a semiconductor **laser** pumped **laser** system and was accomplished with an average electrical power consumption by the pump **lasers** of less than 8 W.

Several ideas are presented to enhance the systems performance including methods for compressing the pulse width and for increasing the amplified pulse energy.

83/9/1 (Item 1 from file: 350)
DIALOG(R) File 350:Derwent WPIX (c) Thomson Derwent. All rts. reserv.
013290974 WPI Acc No: 2000-462909/200040 XRPX Acc No: N00-345214
Heavy-pulse generator
Patent Assignee: ENERGOSERVIS RES PRODN CENTRE CO LTD (ENER-R)
Inventor: BERNIKOV A S; DMITRIEV I K
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
RU 2138905	C1	19990927	RU 96124719	A	19961225	200040	B

Priority Applications (No Type Date): RU 96124719 A 19961225
Abstract (Basic): RU 2138905 C1

NOVELTY - Device has rectifying bridge, clipping resistor, which resistance conforms to condition of clipping charging current of accumulation capacitor for quarter of mains voltage half-wave. Its inductance conforms to condition of protection against high harmonic frequencies caused by excitation of oscillator circuit, which comprises accumulation capacitor, which is connected to dipole winding and cathode of isolation diode. Second terminal of dipole winding is connected to anode of switching transistor, which cathode is connected to another terminal of accumulation capacitor and negative terminal of rectifying bridge. This provides common line for control pulse generator, which is designed using two-base diode which is synchronously controlled through two electrodes according initial conditions provided by circuits of threshold stabilization and clock cycle. Base 2 is supplied with voltage which provides threshold through accumulating resistor which is connected to common point of cath ode of stabilizing diode of circuit for stabilization of threshold voltage and its current -clipping resistor, which second terminal is connected to cathode of isolation diode and clock pulses with current-clipping resistor, circuit for stabilization of increment rate of threshold voltage. Second terminal of latter circuit is connected to anode of isolation diode which protects clock pulses from clearing by voltage of accumulation capacitor charge. Emitter is supplied with voltage which is generated by control capacitor through resistors which define working frequency, and are switched by setting switch, which is connected to middle point of divider, which one terminal is connected to common line and anode of stabilizing diode of threshold voltage increment rate stabilization circuit. Second terminal is connected to its cathode and common point of base 2 with current-clipping resistor of threshold voltage increment rate stabilization circuit. Base 1 which is connected to common line t hrough matching resistor serves as output of control pulse generator and is connected to control electrode of switching thyristor, which drives oscillator circuit in order to convert power which is accumulated in capacitor into actuating device work through its winding.

USE - Power supply for laser equipment, medical devices, power supply, preferably for conversion of alternating current mains voltage to single pulses which frequency is multiple with respect to mains frequency.

ADVANTAGE - Increased efficiency.

83/9/3 (Item 1 from file: 23)
DIALOG(R) File 23:CSA Technology Research Database

0005903231 IP ACCESSION NO: A00-39507
High-**power** AlGaInAs/**GaAs** microstack **laser** bars
Hanke, C; Korte, L; Acklin, B; Behringer, M; Hermann, G; Luft, J; De Odorico, B; Marchiano, M; Wilhelmi, J
Infineon Technologies, Munich, Germany [Hanke
PAGES: 50-57
PUBLICATION DATE: 2000
PUBLISHER: Bellingham, WA: Society of Photo-Optical Instrumentation Engineers (SPIE Proceedings. Vol. 3947)
CONFERENCE:
In-plane semiconductor lasers IV; Proceedings of the Meeting, San Jose, CA, 24-25 Jan. 2000
LANGUAGE: ENGLISH
ABSTRACT:
We realized microstack **lasers** with two and three active zones for the 800 nm and 900 nm band in the InGaAlAs/**GaAs** system using conventional LOC-SCH structures. Compared to reference **lasers** with only one **laser** active structure, a slight increase in **threshold current** can be observed, which is attributed to an increased **current** spreading due to the highly conducting tunnel junction. The I/V **characteristics** show turn-on **voltages** corresponding to the number of active layers, and there is no significant additional potential barrier due to the tunnel-junctions detectable. The differential efficiency scales with the number of **laser** junctions. AR/HR coated **lasers** with two or three junctions show efficiencies at 800 nm of 2.2 **W**/A and 3.1 **W**/A, respectively. Mounted 1-cm **laser** bars with an asymmetrically coated double microstack-structure have been operated up to 95 **W cw** and 240 **W** qcw with 20 percent **duty cycle**. Due to the high slope efficiency (2.1 **W**/A) and the low series resistance, the wallplug efficiency exceeds 50 percent. qcw-lifetests at 210 **W** with 20 percent **duty cycle** showed only small degradation up to 5 Gshot. (Author)

DESCRIPTORS: *Semiconductor **lasers**; *Laser arrays; *Indium **arsenides**; *Aluminum gallium **arsenide lasers**; *High **power lasers**; Volt-ampere **characteristics**; Tunnel junctions; Near fields; **Laser** outputs
SUBJ CATG: 36, **LASERS** AND MASERS

83/9/4 (Item 1 from file: 2)
DIALOG(R) File 2:INSPEC

08415201 INSPEC Abstract Number: A2002-23-4255P-017, B2002-11-4320J-098
Title: Quantum dots for VCSEL applications at lambda = 1.3 mu m
Author(s): Ledentsov, N.; Bimberg, D.; Ustinov, V.M.; Alferov, Zh.I.;
Author Affiliation: Inst. fur Festkorperphys., Technische Univ. Berlin,
Journal: Physica E Conference Title: Physica E (Netherlands) vol.13, no.2-4 p.871-5
Publisher: Elsevier,
PUBLICATION DATE: March 2002 Country of Publication: Netherlands
CODEN: PELNFM ISSN: 1386-9477
SICI: 1386-9477(200203)13:2/4L.871:QDVA;1-A
Material Identity Number: G387-2002-004
U.S. Copyright Clearance Center Code: 1386-9477/02/$22.00
Conference Title: Tenth International Conference on Modulated Semiconductor Structures. MSS 10
Conference Sponsor: Johannes Kepler Univ.; Federal Ministr. Educ., Sci. & Culture; Govern. Province of Upper Austria
Conference Date: 23-27 July 2001 Conference Location: Linz, Austria
Document Number: S1386-9477(02)00223-0
Language: English Document Type: Conference Paper (PA); Journal Paper
Treatment: Experimental (X)
ABSTRACT: **GaAs**-based vertical cavity surface-emitting **lasers** (VCSELs) using self-organized quantum dots (QDs) emitting at 1.3 mu m demonstrate device-acceptable parameters. **Threshold currents** below 2 mA, operation **voltage** below 2 V and differential efficiency in excess of 60% are demonstrated. Maximum **CW** output **power** of 0.8 mW is realized for 8 mu m oxide-confined aperture device. Using fully oxidized top and bottom distributed Bragg reflectors allows reducing the total thickness of the structure to only 5-6 mu m. **Lifetime** and temperature **cycling** tests confirm high reliability of the device. Confinement of nonequilibrium carriers in the QDs facilitates applications in VCSEL arrays with ultrasmall apertures and microcavities. Low homogeneous line width in single QDs makes potentially possible realization of single QD VCSELs. (15 Refs)

83/9/5 (Item 2 from file: 2)
DIALOG(R) File 2:INSPEC

08020904 INSPEC Abstract Number: A2001-19-4255P-027, B2001-10-4320J-028
Title: Quasi RT-**CW** operation of **InGaAs** /InGaAsP strained quantum well **lasers**
Author(s): Chen, J.X.; Li, A.Z.; Chen, Y.Q.; Guo, F.M.; Lin, C.
Author Affiliation: Inst. of Metall., Acad. Sinica, Shanghai, China
Journal: Journal of Crystal Growth Conference Title: J. Cryst. Growth (Netherlands) vol.227-228 p.338-42
Publisher: Elsevier,
PUBLICATION DATE: July 2001 Country of Publication: Netherlands
CODEN: JCRGAE ISSN: 0022-0248
Conference Title: Molecular Beam Epitaxy 2000. Eleventh International Conference on Molecular Beam Epitaxy
Conference Date: 11-15 Sept. 2000 Conference Location: Beijing, China
Document Number: S0022-0248(01)00717-5
Language: English Document Type: Conference Paper (PA); Journal Paper
ABSTRACT: **Lasers** with emission wavelength of 1.8-2.1 mu m offer many important applications to **laser** spectroscopy, eye-safe medical care and trace chemical detection. Strained **InGaAs**/InGaAsP structures on InP substrates have been reported as an alternative approach for the development of semiconductor **laser** diodes in the spectral range 1.8-2.1 mu m due to the superior InP substrate quality and mature processing technology. In this paper we report the fabrication and performances of **InGaAs**/InGaAsP/InP strained quantum well **lasers** grown by gas source molecular beam epitaxy. The diodes show good I-V **characteristics** and the typical turn-on **voltage** at room temperature is around 0.4-0.5 V. A **threshold current** of about 120 mA is achieved for a chip with 500 mu m cavity length and 4.5 mu m stripe width. The maximum output **power** with 10% **duty cycle** is 18 mW. The main peak of the **laser** spectrum is located at 1.84 mu m. (5 Refs)

104/9/2 (Item 2 from file: 23)
DIALOG(R) File 23:CSA Technology Research Database

0005103649 IP ACCESSION NO: 0239849
Compression of **pulses** generated by an electroabsorption modulator at 10 GHz
Chernikov, S V; Guy, M J; Taylor, J R; Moodie, D G; Kashyap, R
Imperial Coll, London, Engl
CONF PROC LASER ELECTR OPTIC SOC ANNU MEET, 11, 1996
PUBLICATION DATE: 1996
PUBLISHER: IEEE, PISCATAWAY, NJ, (USA)
CONFERENCE:
The 1996 Conference on Lasers and Electro-Optics, CLEO'96, Anaheim, CA, USA , 02-07 June 1996
DOCUMENT TYPE: Conference Paper; Journal Article
RECORD TYPE: Abstract
LANGUAGE: English
FILE SEGMENT: Solid State & Superconductivity Abstracts
ABSTRACT:
For optical multiplexing and demultiplexing in ultrahigh-bit-rate optical time-division-multiplexed systems as well as optical processing, there is a demand for sources of short **pulses** with low **duty cycles**. The implementation of direct modulation techniques based on high-speed modulators like the electroabsorption modulator (EAM) is practically very attractive, but with a single-pass modulator it is difficult to generate the low **duty cycles** required. So far, 6.3-**ps pulses** at 10 GHz with a 6% **duty cycle** have been achieved using an EAM in conjunction with chirp compensation. This paper demonstrate the application of linear and nonlinear techniques in order to further compress **pulses** generated by an EAM.

DESCRIPTORS: Semiconductor **lasers**; Distributed feedback **lasers**; **Continuous wave lasers**; Lithium compounds; **Current voltage characteristics**; Electric delay lines; Optical fibers

104/9/3 (Item 3 from file: 23)
DIALOG(R) File 23:CSA Technology Research Database

0003002384 IP ACCESSION NO: 1340126; 1340126
High-speed photodetectors using GaAs MESFET.

Umeda, T; Cho, Y
Inst. Sci. and Ind. Res., Osaka Univ., Ibaraki 567, Japan

ELECTRON. COMMUN. JAPAN., pt. 2, v 69, n 1, p 83-90, 1986
PUBLICATION DATE: 1986

DOCUMENT TYPE: Journal Article
RECORD TYPE: Abstract
LANGUAGE: English
FILE SEGMENT: Electronics & Communications Abstracts; Solid State & Superconductivity Abstracts

ABSTRACT:
This paper deals with experimental investigations of light response performance and operation mechanisms of the GaAs MESFET when used as a high-speed photodetector. The GaAs MESFET under test is a device used for a microwave amplifier with 1- mu m gate length and 75 similar to 300- mu m gate width. The illuminating light is either **CW** (He -Ne) or **pulsed** (dye **laser** with **10-psec pulse width** and 7-nsec **pulse** interval). The light is focused by the object lens and illuminates the area between the source and drain within 5 mu m. When the FET is in the pinchoff state the **pulse** response is shown to be much improved. The output current depends on the **input** light power and tends to saturation. Light response speed of 100 psec can be obtained from a sample with 75- mu m gate width.

DESCRIPTORS: Gallium arsenide; Mesfet; Transistors; Field effect transistors; Photodetectors; **Current voltage**
SUBJ CATG: S SMED2.10, TRANSISTORS; S SSP7.3, CONDUCTION IN SOLIDS; E ED10.3, JUNCTION PHOTODEVICES; E ED19.5, FIELD EFFECT/MOS/UNIPOLAR/THIN FILM TRANSISTORS; S SMED2.10, TRANSISTORS; S SSP7.3, CONDUCTION IN SOLIDS; E ED10.3, JUNCTION PHOTODEVICES; E ED19.5, FIELD EFFECT/MOS/UNIPOLAR/THIN FILM TRANSISTORS

17/9/5 (Item 1 from file: 104)
DIALOG(R) File 104:AeroBase

0000182293
TITLE: Amplitude and Temporal Jitter Associated with the NPS Active Mode-Locked Sigma Laser

AUTHORS:
Anderson, James A.,
PUBLICATION DATE: Jun 2000
LANGUAGE: English
ORIG REPORT NO: AD-A380302
ABSTRACT:
Electro-optic techniques for analog-to-digital conversion (ADC) are being developed for wideband signal collection and analysis. They have the capability of being used for direct signal reception and ADC at an antenna. A fundamental requirement for these designs is a high-frequency optical pulse train with uniform amplitude and pulse spacing. A mode-locked fiber laser can provide pulse rates and pulse widths suitable for these high bandwidth applications. In this thesis an accurate method for calculating and characterizing with the amplitude and timing jitters of the NPS active mode-locked sigma laser was designed and demonstrated. The method utilizes a wide bandwidth photodetector and a microwave spectrum analyzer to obtain data for analysis. Labview 4.0 software was used to extract and store the data displayed on the spectrum analyzer. Matlab 5.1 software was then used to analyze the Labview data and to perform calculations for the amplitude and temporal jitter. Measurements were made for a microwave sweep oscillator and a **CW** ~~generator~~, then again with the fiber laser operating with each signal source. Final measurements were taken with variable laser diode pump powers by varying the controller currents. Results show that the calculation of the laser jitter is not dependent on the upper limit of the noise power integral calculation above 10 kHz; however, the jitter is highly dependent on the value of the lower frequency limit and decreases dramatically as the lower limit is increased. Laser amplitude jitter was found to decrease by 30% and timing jitter by 0.85 Ps when the laser was operated with the **CW** generator instead of the sweep oscillator. Also, it was found that as pump power was increased, **laser timing** jitter decreased. (DTIC)

DESCRIPTORS:
MAJOR DESCR: ELECTRO-OPTICS; **SEMICONDUCTOR LASERS**; SPECTRUM ANALYSIS; VIBRATION; CONTINUOUS RADIATION; FIBER LASERS; AMPLITUDE MODULATION; MICROWAVE OSCILLATORS

104/9/5 (Item 2 from file: 2)
DIALOG(R) File 2:INSPEC

06707625 INSPEC Abstract Number: B9711-3240G-006
Title: Fast NbN superconducting switch controlled by optical radiation
Author(s): Zorin, M.; Milostnaya, I.; Gol'tsman, G.N.; Gershenzon, E.M.
Author Affiliation: Moscow State Pedagogical Univ., Russia
Journal: IEEE Transactions on Applied Superconductivity
Conference Title: IEEE Trans. Appl. Supercond. (USA) vol.7, no.2, pt.3 p.3734-7
Publisher: IEEE,
PUBLICATION DATE: June 1997 Country of Publication: USA
CODEN: ITASE9 ISSN: 1051-8223
SICI: 1051-8223(199706)7:2:3L.3734:FSSC;1-1
Material Identity Number: 0646-97005
U.S. Copyright Clearance Center Code: 1051-8223/97/$10.00
Conference Title: 1996 Applied Superconductivity Conference
Conference Sponsor: Northrop Grumman Sci. & Technol. Center; Westinghouse Sci. & Technol. Center; et al
Conference Date: 25-30 Aug. 1996 Conference Location: Pittsburgh, PA,
Language: English Document Type: Conference Paper (PA); Journal Paper
Treatment: Experimental (X)

ABSTRACT: The switching time and the optical control **power** of the NbN superconducting switch have been measured. The device is based on the ultrathin film 5-8 nm thick patterned as a structure of several narrow parallel strips (~1 mu m wide) connected to wide **current** leads. The **current-voltage** characteristic of the switch at temperature 4.2 K demonstrated a hysteresis due to DC **current** self-heating. We studied the superconducting-to-resistive state transition induced by both optical and bias-**current** excitations. The optical pulse duration was ~20 ps and the rise time of the **current** step was determined to be less than 50 ps. The optical pulse was delivered to the switch by the semiconductor **laser** through an optical fiber. We found that the measured switching time is less than the duration of the optical excitation. The **threshold** optical **power** density does not exceed 3.10/sup 3/ W/cm/sup 2/. The proposed device can be used in the fiber **input** of LTS rapid single flux quantum circuits. (16 Refs)

104/9/6 (Item 3 from file: 2)
DIALOG(R) File 2:INSPEC

06705587 INSPEC Abstract Number: B9711-4260D-026
Title: Light-emitting **diodes** for the 1.7-2.4 um wavelengths
Author(s): Popov, A.A.; Sherstnev, V.V.; Yakovlev, Y.P.
Author Affiliation: IBSG, St. Petersburg, Russia
Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA) vol.3002 p.132-40
Publisher: SPIE-Int. Soc. Opt. Eng,
PUBLICATION DATE: 1997 Country of Publication: USA
CODEN: PSISDG ISSN: 0277-786X
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Material Identity Number: C574-97127
U.S. Copyright Clearance Center Code: 0277-786X/97/$10.00
Conference Title: Light-Emitting Diodes: Research, Manufacturing, and Applications
Conference Sponsor: SPIE
Conference Date: 13-14 Feb. 1997 Conference Location: San Jose, CA,
Language: English Document Type: Conference Paper (PA); Journal Paper
Treatment: Experimental (X)

ABSTRACT: The basic parameters of GaInAsSb mid-IR light emitting **diodes** designed for spectroscopic applications were shown. Two types of room temperature devices were presented: **diodes** for fixed emission wavelengths between 1.7 and 2.4 mu m wavelengths and **diodes** tuned by drive current over wide wavelength range of 2.1-2.6 mu m. The **diodes** were investigated for both **continuous wave** (**CW**) and **pulse** operation. The current-voltage characteristics, emission spectra, beam divergence, temperature shift of the emission band were presented and discussed. To find **higher** performance the output power was investigated versus **pulse widths** and repetition rates. It was reported that the GaInAsSb LED power was improved up to 2-3 times to the values as high as 3.7 mW **CW** and 82 mW **pulse** at lambda =1.94 mu m as an example. It is shown that room-temperature operation, low electric power consumption, reduced cost and easy routine execution are the advantages to LEDs in comparison with spectrometers based on a **diode lasers** and thermal emitters. Sensitive and selective apparatuses for pollution detection, medicine and process control in the 1.7-2.4 mu m wavelength range can be built on base of these LEDs as a source of radiation. (13 Refs)

Descriptors: gallium arsenide; gallium compounds; III-V semiconductors; indium compounds; infrared sources; light emitting **diodes**
Identifiers: light-emitting **diodes**; GaInAsSb mid-IR light emitting **diodes** design; spectroscopic applications; room temperature devices; fixed emission wavelengths; **continuous wave**; **pulse** operation; **current-voltage characteristics**

104/9/7 (Item 4 from file: 2)
DIALOG(R) File 2:INSPEC

05995670 INSPEC Abstract Number: A9515-4255P-013, B9508-4320J-069
Title: Resonant tunneling injection quantum-well **lasers**
Author(s): Lutz, C.R., Jr.; Agahi, F.; Lau, K.M.
Author Affiliation: Dept. of Electr. & Comput. Eng., Massachusetts Univ., Amherst, MA, USA
Journal: IEEE Photonics Technology Letters vol.7, no.6 p.596-8
PUBLICATION DATE: June 1995 Country of Publication: USA
CODEN: IPTLEL ISSN: 1041-1135
U.S. Copyright Clearance Center Code: 1041-1135/95/$04.00
Language: English Document Type: Journal Paper (JP)
Treatment: Practical (P); Experimental (X)
ABSTRACT: We report, for the first time, the observation of resonant tunneling induced negative differential characteristics in the light-**current** (L-I) and light-**voltage** (L-V) **curves** of a single-quantum-well semiconductor **laser**. Broad-stripe **lasers** have exhibited **CW threshold current** density of 50 A/cm/sup 2/ at 77 K, with a sharp decrease in output light **power** at 68 A/cm/sup 2/, which corresponds to a resonant point in the **current-voltage** (I-V) characteristics of the device. Peak to valley ratios of more than 1.5:1 were observed in the L-I and L-V curves. (12 Refs)
Subfile: A B
Descriptors: **current** density; negative resistance devices; quantum well **lasers**; resonant tunnelling devices
Identifiers: resonant tunneling injection quantum-well **lasers**; resonant tunneling induced negative differential characteristics; light-**current** curves; light-**voltage** curves; single-quantum-well semiconductor **laser**; broad-stripe **lasers**; **CW threshold current** density; output light **power**; resonant point; **current-voltage** characteristics; **peak to valley ratios**; SCH-SQW **laser**; 77 K; AlGaAs-InGaAs-GaAs
Class Codes: A4255P (Lasing action in semiconductors); A4260B (Design of specific laser systems); A7340L (Semiconductor-to-semiconductor contacts, p-n junctions, and heterojunctions); B4320J (Semiconductor lasers)
Chemical Indexing:
AlGaAs-InGaAs-GaAs int - AlGaAs int - InGaAs int - GaAs int - Al int - As int - Ga int - In int - AlGaAs ss - InGaAs ss - Al ss - As ss - Ga ss - In ss - GaAs bin - As bin - Ga bin (Elements - 3,3,2,4)
Numerical Indexing: temperature 7.7E+01 K

104/9/8 (Item 1 from file: 8)
DIALOG(R) File 8:Ei Compendex(R)

06138382 E.I. No: EIP02397098846
Title: Novel VCSEL-based smart pixel for high-contrast, high-gain and high-speed optical switching
Author: Knupfer, B.; Welker, M.; Jung, C.; Wiedenmann, D.; Ebeling, K.J.; Oehler, Ch.; Geisselbrecht, W.; Malzer, S.; Dohler, G.H.
Corporate Source: Institut fur Technische Physik I Universitat Erlangen, D-91058 Erlangen, Germany
Conference Title: Optoelectronic Interconnects V
Conference Location: San Jose, CA, United States Conference Date: 19980128-19980129
Sponsor: SPIE
E.I. Conference No.: 59664
Source: Proceedings of SPIE - The International Society for Optical Engineering v 3288 1998. p 23-32
PUBLICATION YEAR: 1998
CODEN: PSISDG ISSN: 0277-786X
Language: English
Document Type: CA; (Conference Article) Treatment: X; (Experimental)
Journal Announcement: 0209W5
ABSTRACT: We present a novel smart pixel composed of an optoelectronic **threshold** switch with gain and a vertical cavity surface-emitting **laser** (VCSEL). In this smart pixel two surface-normal **input** optical beams control an output optical beam emitted by the VCSEL. In this present hybrid version of the VCSEL-based smart pixel is capable of opto-optical switching with an output contrast ratio in excess of 30 dB at an optical output **power** of about 1.5 mW. For quasi-stationary operation we achieve an optical gain of up to 3 multiplied by 10**5. We also report drastic improvements on the switching dynamics. Operating the receiver with an optical **input power** of 130 muW we achieve bitrates of up to 160 Mbit/s and an optical gain of 11, while optical **inputs** of 410 muW result in a maximum bitrate of 400 Mbit/s and an optical gain of 3.6. The minimum **input** optical energy required for switching is 765 fJ, the AC output contrast ratio is 9 dB. Optically performed NAND and NOR logic operations are demonstrated at 40 Mbit/s with a fan-out of 7.6. We further show that the functionality of this smart pixel can easily be extended to electric read-out of **input** optical data and to direct electric control of the VCSEL within the smart pixel configuration. In particular, we demonstrate conversion of electric **input** to optical output data at 1 Gbit/s. 16 Refs.
Descriptors: *Electronics packaging; Semiconductor **lasers**; Switching functions; Optoelectronic devices; Logic gates; Optical interconnects; Photodetectors; **Current voltage** characteristics; Approximation theory; Semiconducting gallium arsenide; Molecular beam epitaxy; Substrates

104/9/9 (Item 2 from file: 8)
DIALOG(R) File 8:Ei Compendex(R)

05953905 E.I. No: EIP01506759308
Title: Enhanced **CW** performance of the interband cascade **laser** using improved device fabrication
Author: Bradshaw, J.L.; Pham, J.T.; Yang, R.Q.; Bruno, J.D.; Wortman, D.E.
Corporate Source: U.S. Army Research Laboratory, Adelphi, MD 20783-1197, United States
Source: IEEE Journal on Selected Topics in Quantum Electronics v 7 n 2 March/April 2001. p 102-105
PUBLICATION YEAR: 2001
CODEN: IJSQEN ISSN: 1077-260X
Language: English
Document Type: JA; (Journal Article) Treatment: T; (Theoretical); X; (Experimental)
Journal Announcement: 0112W3
ABSTRACT: **Continuous-wave** (**CW**) operation of a mid-infrared type-II interband cascade (IC) **laser** has been demonstrated at temperatures up to 142 K by improving device processing and fabrication. Also, the IC **laser** exhibited record-high wall-plug efficiencies (similar to 18% at 60 K) with considerable **CW** output **powers**. An analysis of the thermal resistance partially explains the still low maximum **CW** operating temperature and suggests further potential for improvement with continued development of fabrication/packaging techniques. 28 Refs.
Descriptors: *Quantum well **lasers**; Infrared devices; Semiconductor device manufacture; Quantum efficiency; Heat resistance; Semiconductor superlattices; Molecular beam epitaxy; **Current voltage** characteristics; **Current** density
Identifiers: Interband cascade **laser**; **Continuous-wave** operation; Mid-infrared **laser**; Differential external quantum efficiency; **Threshold current** density

104/9/10 (Item 3 from file: 8)
DIALOG(R) File 8:Ei Compendex(R)

05906488 E.I. No: EIP01416681798
Title: Mid-IR interband cascade **lasers** : Progress toward high performance
Author: Bruno, J.D.; Yang, R.Q.; Bradshaw, J.L.; Pham, J.T.; Wortman, D.E.
Corporate Source: U.S. Army Research Laboratory, Adelphi, MD 20783, United States
Conference Title: In-Plane Semiconductor Lasers V
Conference Location: San Jose, CA, United States Conference Date: 20010122-20010123
Sponsor: SPIE
E.I. Conference No.: 58470
Source: Proceedings of SPIE - The International Society for Optical Engineering v 4287 2001. p 1-12
PUBLICATION YEAR: 2001
CODEN: PSISDG ISSN: 0277-786X
Language: English
Document Type: CA; (Conference Article) Treatment: T; (Theoretical); X; (Experimental)
Journal Announcement: 0110W3
ABSTRACT: Type-II interband cascade (IC) **lasers** take advantage of the broken-gap alignment in type-II quantum wells to reuse electrons for sequential photon emissions from serially connected active regions. Here, we review our recent progress in InAs/GaInSb type-II IC **lasers** at emission wavelengths of 3.6-4 mu. These semiconductor **lasers** have exhibited significantly higher differential quantum efficiencies and peak **powers** than previously reported. Low **threshold current** densities (e.g., similar to 56 A/cm**2 at 80 K) and **power** efficiency exceeding 14% were observed from mesa-stripe **lasers** when operated in **cw** mode. Also, these **lasers** were able to operate at temperatures up to similar to 252 K in pulsed mode and similar to 142 K in **cw** mode. We observed slope efficiencies exceeding 1 W/A/facet, corresponding to a differential external quantum efficiency exceeding 600%, from devices at temperatures above 80 K. A peak output **power** of similar to 6 W/facet was observed from an IC **laser** at 80 K. 38 Refs.
Descriptors: *Semiconductor **lasers**; Infrared radiation; Semiconducting indium compounds; Semiconducting gallium compounds; Performance; Light emission; Quantum efficiency; **Current** density; Molecular beam epitaxy; Thermocouples; X ray diffraction analysis; **Current voltage** characteristics

104/9/12 (Item 5 from file: 8)
DIALOG(R) File 8:Ei Compendex(R)

05818514 E.I. No: EIP01216511145
Title: Characterization and modeling of quantum cascade **lasers** based on a photon-assisted tunneling transition
Author: Blaser, S.; Diehl, L.; Beck, M.; Faist, J.; Oesterle, U.; Xu, J.; Barbieri, S.; Beltram, F.
Corporate Source: Institute of Physics University of Neuchatel, CH-2000 Neuchatel, Switzerland
Source: IEEE Journal of Quantum Electronics v 37 n 3 March 2001 2001. p 448-455
PUBLICATION YEAR: 2001
CODEN: IEJQA7 ISSN: 0018-9197
Language: English
Document Type: JA; (Journal Article) Treatment: T; (Theoretical)
Journal Announcement: 0105W4
ABSTRACT: A detailed characterization and modeling of long-wavelength (lambda similar to 10 mum) quantum cascade (QC) **lasers** based on a photon-assisted tunneling transition are presented. In particular, the influence of the finite lifetime of the lower state of the **laser** transition on the current-voltage and **threshold** current versus temperature characteristics have been studied both theoretically and experimentally. It is shown that, for our structure, the value of the lower state lifetime can be extracted from the voltage-current curve; the value we found was 2.6 **ps**. In addition, this model allows to understand the abrupt degradation of the performance of the device for T greater than 150 K. Low temperature (T = 10 K) **threshold** current densities of 1.1 kA/cm**2 and a tuning range of 85 cm//-//1 in pulsed mode are reported. In **continuous-wave** mode, the emission linewidth of a free-running **laser** was determined to be 3.9 MHz. 17 Refs.
Descriptors: *Quantum well **lasers**; Semiconductor device models; **Current voltage characteristics**; Current density; Temperature; Photons; Electron tunneling; Semiconductor device structures; Degradation; **Laser** tuning; **Laser** pulses; **Laser** modes; Light emission

104/9/15 (Item 8 from file: 8)
DIALOG(R) File 8:Ei Compendex(R)

05191872 E.I. No: EIP98124517959
Title: High performance laterally gain coupled InGaAs/AlGaAs DFB **lasers**
Author: Kamp, M.; Hofmann, J.; Forchel, A.; Schaefer, F.; Reithmaier, J.P.
Corporate Source: Univ of Wuerzburg, Wuerzburg, Ger
Conference Title: Proceedings of the 1998 International Conference on Indium Phosphide and Related Materials
Conference Location: Tsukuba, Jpn Conference Date: 19980511-19980515
Sponsor: IEEE
E.I. Conference No.: 49335
Source: Conference Proceedings - International Conference on Indium Phosphide and Related Materials 1998. IEEE, Piscataway, NJ, USA,98CH36129. p 831-834
PUBLICATION YEAR: 1998
CODEN: CPRMEG
Language: English
Document Type: CA; (Conference Article) Treatment: X; (Experimental)
Journal Announcement: 9902W3
ABSTRACT: We have investigated gain coupled **lasers** based on metal gratings patterned laterally to the **laser** ridge. For sufficiently small ridges, the evanescent field of the **laser** mode couples strongly to the grating. Ridge waveguide **lasers** were processed from an InGaAs/AlGaAs GRINSCH structure. The **cw threshold currents** are around 12 mA for a cavity with 800 mu m length and 2.5 mu m width. These values are comparable to reference **lasers** without metal grating, which shows that there is no significant penalty from loss coupling for a properly designed device. Pulsed monomode emission up to output **power** levels of 64 mW and sidemode suppression ratios up to 45 dB have been obtained, indicating that the lateral coupling is strong enough for stable DFB operation. (Author abstract) 6 Refs.
Descriptors: *Distributed feedback **lasers**; **Current voltage** characteristics; Semiconducting indium gallium arsenide; Semiconducting aluminum compounds; Semiconductor device structures; **Threshold voltage**; **Laser** resonators; Diffraction gratings

104/9/16 (Item 9 from file: 8)
DIALOG(R) File 8:Ei Compendex(R)

05012650 E.I. No: EIP98054192712
Title: Low-**threshold** room-temperature **CW** operation of ZnSe-based blue/green **laser diodes** grown on conductive ZnSe substrates
Author: Nakanishi, F.; Doi, H.; Okuda, N.; Matsuoka, T.; Katayama, K.; Saegusa, A.; Matsubara, H.; Yamada, T.; Uemura, T.; Irikura, M.; Nishine, S.
Corporate Source: Sumitomo Electric Industries, Ltd, Osaka, Jpn
Source: Electronics Letters v 34 n 5 Mar 5 1998. p 496-497
PUBLICATION YEAR: 1998
CODEN: ELLEAK ISSN: 0013-5194
Language: English
Document Type: JA; (Journal Article) Treatment: T; (Theoretical)
Journal Announcement: 9807W2
ABSTRACT: SCH **laser** structures of ZnCdSe/ZnSe/ZnMgSSe have been grown on conducive ZnSe substrates by molecular beam epitaxy. **Continuous-wave laser** operation at room temperature was observed at a wavelength of 527.9 nm (2.349 eV). The **threshold current** and **threshold voltage** were 44 mA (222 A/cm**2) and 5.4 V, respectively. A lifetime of 74 s at a constant light output **power** of 2 mW was obtained. (Author abstract) 7 Refs.

104/9/17 (Item 10 from file: 8)
DIALOG(R) File 8:Ei Compendex(R)

04929253 E.I. No: EIP98024042750
Title: Analysis of degradation mechanisms in high **power** AlGaAs 808 nm **laser** bars
Author: Arias, J.; Esquivias, I.; Daiminger, F.X.; Heineman, S.; Vassilakis, E.; Hirtz, J.P.
Corporate Source: Universidad Politecnica de Madrid, Madrid, Spain
Conference Title: Proceedings of the 1997 10th IEEE Lasers and Electro-Optics Society Annual Meeting, LEOS. Part 2 (of 2)
Conference Location: San Francisco, CA, USA Conference Date: 19971110-19971113
Sponsor: IEEE
E.I. Conference No.: 47740
Source: Conference Proceedings - Lasers and Electro-Optics Society Annual Meeting-LEOS v 2 1997. IEEE, Piscataway, NJ, USA,97CB36057. p 72-73
PUBLICATION YEAR: 1997
CODEN: CPLSE4 ISSN: 1092-8081
Language: English
Document Type: CA; (Conference Article) Treatment: X; (Experimental)
Journal Announcement: 9804W1
ABSTRACT: The degradation mechanisms of 20 W **continuous wave** (**CW**) AlGaAs linear array bars were studied by analyzing the subthreshold optical **power-current-voltage** characteristics (P-I-V) at different aging times. The **laser** structure is a single quantum well graded index separate confinement heterostructure (SQW-GRINSCH) grown by metal organic chemical vapor deposition. The main optoelectronic characteristics (**threshold current**, slope efficiency, conversion efficiency, lasing wavelength) and the P-I-V characteristics were measured as a function of the aging time. The spontaneous optical **power** emitted from the low-reflectivity facet and the external **voltage** were accurately measured at drive **currents** ranging between 1 nA and 1 A. 2 Refs.

104/9/18 (Item 11 from file: 8)
DIALOG(R) File 8:Ei Compendex(R)

04271290 E.I. No: EIP95102904157
Title: Multiple wavelength Fabry-Perot **lasers** fabricated by vacancy-enhanced quantum well disordering
Author: Hofstetter, D.; Zappe, H.P.; Epler, J.E.; Riel, P.
Corporate Source: Paul Scherrer Inst Zurich, Zurich, Switz
Source: Applied Physics Letters v 67 n 14 Oct 2 1995. p 1978-1980
PUBLICATION YEAR: 1995
CODEN: APPLAB ISSN: 0003-6951
Language: English
Document Type: JA; (Journal Article) Treatment: X; (Experimental)
Journal Announcement: 9512W3
ABSTRACT: The use of vacancy-enhanced disordering to locally shift the band gap of a single quantum well separate-confinement double heterostructure is described. Ridge waveguide Fabry-Perot **lasers** were fabricated from unshifted and shifted sections on the same **laser** bar. Both showed **cw** output **powers** up to 12 mW per facet, **threshold currents** less than 14 mA and a slope efficiency of 0.42 W/A. These values are comparable with those of unannealed devices fabricated from the same material. 12 Refs.
Descriptors: *Quantum well **lasers**; Fabrication; Annealing; Energy gap; Semiconducting gallium arsenide; Semiconducting aluminum compounds; Emission spectroscopy; Photoluminescence; **Current voltage** characteristics; Plasmas

104/9/19 (Item 1 from file: 95)
DIALOG(R) File 95:TEME-Technology & Management

01393722 20000206479
Optimization of GaAsP/AlGaAs-based QW **laser** structures for high **power** 800 nm operation
(Optimierung GaAsP/AlGaAs-basierter Quantentopflaserstrukturen fuer den Hochleistungsbetrieb bei 800 nm)
Knauer, A; Bugge, F; Erbert, G; Wenzel, H; Vogel, K; Zeimer, U; Weyers, M
F.-Braun-Inst. f. Hoechstfrequenztech., Berlin, D
Ninth Biennial Workshop on Organometallic Vapour Phase Epitaxy, 23-27 May 1999, Ponte Vedra Beach, FL, USAJournal of Electronic Materials, v29, n1, pp53-56, 2000
Document type: journal article; 06 Conference paper Language: English
Record type: Abstract
ISSN: 0361-5235
ABSTRACT:
A detailed study is presented of the MOVPE (metal-organic vapor phase epitaxy) growth of 800 nm **diode laser** structures based on the combination of a GaAsP quantum well with well-established AlGaAs waveguide structures. By optimizing the strain and thick-ness of the quantum well, highly-reliable **diode lasers** with low **threshold current** and high efficiency were demonstrated. 100 micron aperture 'broad area' devices mounted epi-side up achieve a **CW** output **power** of 8.9 W with a wall-plug efficiency of 50 %. These output **powers** represent record values for **diode lasers** in this wavelength range. Reliability measurements at 1.5 W and 50 deg C ambient temperature suggest lifetimes > 10000 h.

DESCRIPTORS: ALUMINIUM GALLIUM ARSENIDE; QUANTUM WELL **LASERS**; METALORGANIC VAPOUR PHASE EPITAXY; **DIODE LASERS**; WAVE GUIDES; FILM THICKNESS; APERTURE; **CONTINUOUS WAVE** OPERATION; DURATION OF LIFE; ARSENIDES; X RAY DIFFRACTION; **THRESHOLD CURRENT**; **CURRENT VOLTAGE** CHARACTERISTICS;

104/9/20 (Item 2 from file: 95)
DIALOG(R) File 95:TEME-Technology & Management

01287701 E99020268229
Room-temperature **continuous wave** operation of InGaN **laser diodes** with vertical conducting structure on Si substrate
(Der kontinuierliche Betrieb von InGaN-Laserdioden mit einer senkrechtleitenden Struktur auf einem SiC-Substrat bei Raumtemperatur)
Kuramata, A; Kubota, S; Soejima, R; Domen, K; Horino, K; Tanahashi, T
Fujitsu Lab., Atsugi, J
Japanese Journal of Applied Physics, Part 2 Letters, v37, n11B, pp1373-1375, 1998
Document type: journal article Language: English
Record type: Abstract
ISSN: 0021-4922

ABSTRACT:
For the first time room-temperature **continuous wave** operation of InGaN **laser diodes** with a vertical conducting structure fabricated on a SiC substrate was demonstrated. The **threshold current** and **voltage** were 84 mA and 12 V, respectively, under pulsed operation. The **threshold current** corresponds to a **threshold current** density of 5.6 kA/cm(exp 2), which is the lowest ever reported with InGaN **laser diodes** on a SiC substrate. Under **continuous wave** operation, the **threshold current** and **voltage** were 115 mA and 10.5 V, respectively. The peak lasing wavelength was 408.2 nm. Longitudinal modes of the optical cavity were clearly observed. The **laser** oscillation was observed up to 40 deg C under **CW** operation.

DESCRIPTORS: ROOM TEMPERATURE; CONTINUOUS ACTION **LASERS**; **CONTINUOUS WAVE** OPERATION; NITRIDES; 3 5 COMPOUNDS; **DIODE LASERS**; **THRESHOLD CURRENT**; SANDWICH CONSTRUCTION; **CURRENT VOLTAGE** CHARACTERISTICS; LIGHT EMISSION; OUTPUT **POWER**; SILICON CARBIDE; GALLIUM NITRIDE; INDIUM GALLIUM NITRIDE
IDENTIFIERS: SENKRECHTLEITUNG; SENKRECHTLEITENDE STRUKTUR; Indiumgalliumnitridlaserdiode; Raumtemperatur-**CW**-Betrieb

104/9/21 (Item 3 from file: 95)
DIALOG(R) File 95:TEME-Technology & Management

01212875 C98050225491
InGaN/GaN/AlGaN-based **laser diodes** with an estimated lifetime of longer than 10000 hours
(InGaN/GaN/AlGaN-Laserdioden mit einer abgeschaetzten Lebensdauer von mehr als 10000 Stunden)
Nakamura, S
Nichia Chem. Ind., Tokushima, J
MRS Bulletin, v23, n5, pp37-43, 1998
Document type: journal article Language: English
Record type: Abstract
ISSN: 0883-7694

ABSTRACT:
InGaN MQW LDs (multiple quantum well **laser diodes**) with MD-SLS (modulation-doped strained-layer superlattice) cladding layers grown on the ELOG (epitaxially laterally overgrown) substrate were demonstrated to have an estimated lifetime longer than 10000 h under conditions of RT-**cw** (room temperature **continuous-wave**) operation. The use of the MD-SLS cladding layers and the ELOG substrate was effective for lengthening the lifetime of the LDs. Self-pulsation phenomena were observed with a frequency of 3.5 GHz. The RIN (relative intensity noise) less than -145 dB//Hz was obtained even at 6 % optical feedback using the HF (high frequency) modulation of 600 MHz. The **threshold** carrier density of the InGaN MQW-structure LDs was estimated to be 3x10(exp 19) cm(exp -3) using a carrier lifetime of 1.8 **ns**. These results indicate a promising future for the III-nitride-based short-wavelength LDs.

DESCRIPTORS: NITRIDES; **DIODES**; OPERATING TIME--WORKING TIME; SEMICONDUCTOR MATERIALS; CHEQUERED PATTERN; LED--LIGHT EMITTING **DIODES**; ELECTROLUMINESCENCE; GALLIUM NITRIDE; THERMAL EXPANSION; THIN FILMS; CRACKING--FRACTURING; EPITAXIAL TECHNIQUE; MECHANICAL STRESS; SUPERLATTICE; DISLOCATIONS; SAPPHIRE; ORGANOMETALLIC CVD METHOD; CRYSTAL GROWTH; CRYSTAL ORIENTATION; FILM THICKNESS; SILICON DIOXIDES; TRANSMISSION ELECTRON MICROSCOPES; DOPING; **CURRENT VOLTAGE CHARACTERISTICS**; EMISSION SPECTRUM; INDIUM NITRIDE
IDENTIFIERS: GALLIUMALUMINIUMNITRID; GALLIUMALUMINIUMINDIUMNITRID; Halbleiterdiode; In-Ga-Nitrid-Quantentopf; CVD-Methode; LED

104/9/22 (Item 4 from file: 95)
DIALOG(R) File 95:TEME-Technology & Management

01205003 E98050686239
Materials issues for InGaN-based **lasers**
(Materialien fuer InGaN-Laserdioden)
Nakamura, S
Nichia Chemical Ind., Tokushima, J
Journal of Electronic Materials, v27, n4, pp160-165, 1998
Document type: journal article Language: English
Record type: Abstract
ISSN: 0361-5235

ABSTRACT:
InGaN multi-quantum-well-structure(MQW) **laser diodes** (LDs) with Al(0.14)Ga(0.86)N/GaN modulation doped strained-layer superlattice (MD-SLS) cladding layers grown on an epitaxially laterally overgrown GaN (ELOG) substrate were demonstrated to have a lifetime of more than 1800 h under the condition of room-temperature **continuous-wave** operation. On the other hand, the LDs grown directly on the sapphire substrate had a lifetime of shorter than 900 h. With the operating current increasing to above the **threshold**, s self-pulsation was observed to have a high frequency of 3 GHz and a photon lifetime of 0,7 **ps**. The use of the MD-SLS was effective for reducing the operating voltage of the LDs. The ELOG substrate was used to reduce the number of threading dislocations in the InGaN MQW structure.

DESCRIPTORS: **DIODE LASERS**; ALUMINIUM NITRIDE; SUPERLATTICE; DOPING PROFILES; DURATION OF LIFE; SUBSTRATES; SAPPHIRE; CRITICAL FREQUENCY ; OPERATING VOLTAGE; QUANTUM WELLS; CRYSTAL DISLOCATION; WURTZITE LATTICE; METALORGANIC CHEMICAL VAPOUR DEPOSITION; CRYSTAL GROWTH; CHEQUERED PATTERN; ROOM TEMPERATURE; **CURRENT VOLTAGE CHARACTERISTICS**; EMISSION SPECTRUM; IMPULSE OPERATION; DELAY TIME; **THRESHOLD** CURRENT; CARRIER DENSITY; GALLIUM NITRIDE
IDENTIFIERS: InGaN-Laserdiode; Betriebsspannung

104/9/23 (Item 5 from file: 95)
DIALOG(R) File 95:TEME-Technology & Management

01012935 E96080085227
High **CW power** (>200 mW/facet) at 3.4 micron from InAsSb/InAlAsSb strained quantum well **diode lasers**
(Hohe Dauerstrichleistung bei 3400 nm aus einem InAsSb/InAlAsSb-Diodenlaser mit gedehntem Quantentopf)
Choi, HK; Turner, GW; Manfra, MJ
Massachusetts Inst. of Technol., Lexington, USA
Electronics Letters, v32, n14, pp1296-1297, 1996
Document type: journal article Language: English
Record type: Abstract
ISSN: 0013-5194

ABSTRACT:
Strained quantum well **diode lasers** consisting of compressively strained InAsSb active layers and tensile strained InAlAsSb barrier layers have exhibited **CW power** of 215 mW/facet at 80 K. The internal quantum efficiency and internal loss coefficient at 80 K are estimated to be 63 % and 9 cm(exp -1), respectively.

DESCRIPTORS: **DIODE LASERS**; INFRARED **LASERS**; QUANTUM WELLS ; **CONTINUOUS WAVE** OPERATION; **CONTINUOUS** ACTION **LASERS**; QUANTUM EFFICIENCY; **CURRENT VOLTAGE** CHARACTERISTICS; **THRESHOLD CURRENT**; **CURRENT** DENSITY; OPERATING **VOLTAGE**; DOUBLE HETEROSTRUCTURE
IDENTIFIERS: INDIUM ARSENID ANTIMONID; INDIUM ALUMINIUM ARSENID ANTIMONID; ALUMINIUM GALLIUM ARSENID ANTIMONID; Dauerstrichleistung; Infrarot-Diodenlaser; Quantentopf

104/9/24 (Item 6 from file: 95)
DIALOG(R) File 95:TEME-Technology & Management

00816726 E94081089226
High **power** and high efficiency operation of Al-free InGaAs/GaInAsP/GaInP GRINSCH SQW **lasers** (lambda about 0.98 micron)
(Al-freier InGaAs/GaInAsP/GaInP-GRINSCH-**Laser**)
Zhang, G
Tampere Univ. of Technol., Tampere, SF
Electronics Letters, v30, n15, pp1230-1232, 1994
Document type: journal article Language: English
Record type: Abstract
ISSN: 0013-5194

ABSTRACT:
High **power** and high quantum efficiency Al-free InGaAs/GaInAsP/GaInP GRINISCH SQW **lasers** emitting at 0.98 micron are reported. A **CW** output **power** as high as 580 mW and single lateral mode **power** up to 280 mW were achieved for the Al-free ridge waveguide **lasers** at room temperature. The **lasers** exhibited a high internal quantum efficiency of 99 % and low internal waveguide loss of 3.2 cm(exp -1). A high characteristic temperature of 217 K and low **threshold current** density of 109 A/cm(exp 2) were also obtained. The results are the best obtained for Al-free 0.98 micron pumping **lasers**.

DESCRIPTORS: GALLIUM INDIUM ARSENIDE; INDIUM GALLIUM ARSENIDE PHOSPHIDE; **DIODE LASERS**; OUTPUT **POWER**; EFFICIENCY FACTOR; **LASER** MODES; **CURRENT** DENSITY; **THRESHOLD CURRENT**; LAMP PUMPING; QUANTUM WELLS; HETEROSTRUCTURE; INDEX OF REFRACTION; MBE--MOLECULAR BEAM EPITAXY; **CURRENT VOLTAGE** CHARACTERISTICS
IDENTIFIERS: GRINSCH **LASER**; Laserdiode; optische Pumpquelle

104/9/25 (Item 1 from file: 99)
DIALOG(R) File 99:Wilson Appl. Sci & Tech Abs

2497079 H.W. WILSON RECORD NUMBER: BAST02129696
High-power (l 9 mm) quantum cascade **lasers**
Slivken, S; Huang, Z; Evans, A
Applied Physics Letters v. 80 no22 (June 3 2002) p. 4091-3
DOCUMENT TYPE: Feature Article ISSN: 0003-6951 LANGUAGE: English
RECORD STATUS: Corrected or revised record

ABSTRACT: The authors demonstrate high-power quantum cascade **lasers** emitting at l > 9 mm. XRD provides evidence of the accurate control of layer thickness and interfaces. Excellent peak power for uncoated **lasers** is obtained at 300 K for 75 period structures. At 300 K, the **threshold** current density is only 1.4 kA/cm2. Between 300 and 425 K, the **laser** shows a characteristic temperature of 167 K. For a **duty cycle** of 6 percent, greater than 150 mW of average power is measured per facet. Simulation of the average power output indicates a thermal resistance of 12 K/W for epilayer-up mounted ridges.

DESCRIPTORS: Quantum cascade **lasers**--Temperature effect;
Current-voltage characteristics;

116/9/7 (Item 2 from file: 2)
DIALOG(R) File 2:INSPEC
(c) Institution of Electrical Engineers. All rts. reserv.
06365487 INSPEC Abstract Number: A9620-4255R-011, B9610-4320G-047
Title: Temporal analysis of pulsed phase conjugation in laser amplifiers: application to Nd:YVO/sub 4/
Author(s): Brignon, A.
Journal: Journal of the Optical Society of America B (Optical Physics) vol.13, no.8 p.1748-57
Publisher: Opt. Soc. America,
PUBLICATION DATE: Aug. 1996 Country of Publication: USA
CODEN: JOBPDE ISSN: 0740-3224
SICI: 0740-3224(199608)13:8L.1748:TAPP;1-R
Material Identity Number: G704-96009
U.S. Copyright Clearance Center Code: 0740-3224/96/0801748-10$10.00
Language: English Document Type: Journal Paper (JP)
Treatment: Theoretical (T); Experimental (X)
ABSTRACT: The theory of phase conjugation in laser amplifiers by saturable-gain degenerate four-wave mixing with copolarized beams is developed for pulses of arbitrary temporal shape and duration in the limit of a weak signal beam. The influence of the **input pulse**'s **characteristics** (energy, temporal pulse shape, duration) on the phase-conjugate reflectivity and on the conjugate pulse shape is analyzed. A sharp instantaneous peak of phase-conjugate reflectivity is predicted at high intensities of the four-wave mixing beams. This effect is experimentally demonstrated at lambda /sub 0/=1064 nm in a Nd:YVO/sub 4/ amplifier pumped by a **CW** Ti:sapphire **laser**. A transient peak reflectivity of R~50% is thus obtained, corresponding to an enhancement of 1.6* compared with the maximum steady-state reflectivity. The experimental results and the theoretical predictions are in good agreement. (25 Refs)

28feb06 16:27:53 User259284 Session D3509.5

SYSTEM:OS - DIALOG OneSearch

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File 344:Chinese Patents Abs Jan 1985-2006/Jan
File 23:CSA Technology Research Database 1963-2006/Feb
File 2:INSPEC 1898-2006/Feb W3
File 6:NTIS 1964-2006/Feb W2
File 8:Ei Compendex(R) 1970-2006/Feb W3
File 14:Mechanical and Transport Engineer Abstract 1966-2006/Feb
File 25:Weldasearch-19662006/Jan (c) TWI Ltd
File 31:World Surface Coatings Abs 1976-2006/Feb
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File 103:Energy SciTec 1974-2006/Jan B2
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File 144:Pascal 1973-2006/Feb W1
File 239:Mathsci 1940-2006/Apr
File 240:PAPERCHEM 1967-2006/Feb W3
File 248:PIRA 1975-2006/Jan W5
File 293:Engineered Materials Abstracts 1966-2006/Feb
File 315:ChemEng & Biotec Abs 1970-2005/Dec
File 323:RAPRA Rubber & Plastics 1972-2006/Jan
File 335:Ceramic Abstracts/World Ceramics Abstracts 1966-2006/Feb
File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec

Set	Items	Description
S1	177560	CW OR CONTINUOUS??(2N)WAVE??
S2	108522	S1 AND (LASER? ? OR DIODE? ?)
S3	14590	S1 AND YAG
S4	1440	S1 AND GARNET
S5	108710	S2:S4
S6	210	S5 AND INPUT?????(3N)PULS????
S7	16	S6 AND COMPRESS???????
S8	5	S6 AND ULTRASHORT?
S9	1	S6 AND ULTRA()SHORT
S10	1	S5 AND NANOPULS?
S11	11	S5 AND NANO??(2N)PULS??????
S12	2622	S5 AND NS
S13	912	S5 AND NANOSEC?
S14	2644	S5 AND PICOSEC?
S15	2583	S5 AND PS
S16	1191	S5 AND FS
S17	2844	S5 AND FEMTOSEC?
S18	268	S12:S17 AND INPUT??????
S19	417	S6:S11 OR S18
S20	2	S19 AND IV
S21	0	S19 AND I()V
S22	1	S19 AND (CURRENT?? OR AMPER?????)(2N)(VOLT?? OR POTENTIAL? ? OR VOLTAGE? ?)
S23	4	S19 AND POWER(5N)(METRIC OR METRICS OR CHARACTERISTIC???? - OR PROPERT???? OR CURVE?? OR GRAPH???? OR PLOT OR PLOTS OR PLOTT?????)

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S24         50   S19 AND POWER(5N)(AMPLITUD??????? OR PEAK????? OR MAXIMUM?? OR MAXIMA?? OR MAXIMI????????)
S25         39   S7:S11 OR S20:S23
S26          5   S24 AND THRESHOLD?
S27          1   S24 AND DERIV???????
S28          1   S24 AND DUTY
S29        828   S5 AND DUTY
S30        597   S29 AND POWER
S31         46   S30 AND VOLTAGE??
S32        139   S30 AND CURRENT
S33         66   S30 AND INPUT????
S34          2   S30 AND S31 AND S32 AND S33
S35          1   S24 AND S30:S33
S36         44   S8:S11 OR S20:S23 OR S25:S28 OR S34 OR S35
S37         32   S36 AND INPUT??????
S38          4   S36 AND THRESHOLD?????(3N)(CURRENT OR CURRENTS OR AMPERAGE-
                 ?? OR VOLTAGE?? OR POTENTIAL OR POTENTIALS OR VOLT?? OR POWER)
S39          7   S36 AND INPUT?????(3N)(CURRENT OR CURRENTS OR AMPERAGE?? OR
                 VOLTAGE?? OR POTENTIAL OR POTENTIALS OR VOLT?? OR POWER)
S40     155375   PULSE(2N)WIDTH??  OR DUTY()(CYCLE?? OR CYCLING??)
S41       2190   5AND40
S42         59   S41 AND MAGNITUDE
S43        125   S41 AND COMBIN?????????
S44        271   S41 AND THRESHOLD?
S45          2   S41 AND METRIC? ?
S46        155   S41 AND INPUT????????
S47       1978   S41 AND PULS?????
S48         90   S41 AND GREATER
S49        150   S41 AND HIGHER
S50         62   S41 AND LARGER
S51          1   S41 AND BIGGER
S52        568   S41 AND PEAK?????
S53         83   S41 AND AMPLITUD????
S54          1   42AND43AND44
S55          1   42AND43AND46
S56          2   42AND43AND47
S57          2   42AND43AND48
S58          1   42AND43AND49
S59          0   42AND43AND50
S60          0   42AND43AND52
S61          1   42AND43AND53
S62         23   S8:S10 OR S20:S23 OR S26:S28 OR S34:S35 OR S38:S39 OR S45 OR S51 OR S54:S61
S63         22   RD S62  (unique items)
S64      15044   POWER? ? AND VOLTAGE? ? AND CURRENT? ? AND THRESHOLD??????
S65        556   S64 AND (DUTY OR CYCLE OR CYCLES OR CYCLING? ?)
S66         49   S65 AND (S1 OR LASER OR LASERS OR YAG OR GARNET)
S67         34   S65 AND (ALGAINP OR GAAS OR GAALAS OR INGAASP PR INGAP OR INGAAS OR INGAASSB OR INASSB OR GAN OR ZNSE
OR ARSENIDE? ? OR SELENIDE? ?)
S68         51   S66:S67
S69          4   S68 AND INPUT??????
S70         34   S68 AND PULS????
S71          1   S68 AND SWEEP?????
S72         51   S68 AND THRESHOLD?
S73         18   S68 AND CHARACTERISTIC?????
S74         21   S68 AND (W OR WATTS OR NI=POWER)
S75         16   S68 AND (APPLY????? OR APPLI??? OR APPLIC??????)
S76          3   S68 AND AMPLITUD?????
S77         51   S69:S76
S78         50   S77 NOT S62
S79         27   RD S78  (unique items)
S80          6   S79 AND CW
S81          3   S79 AND CONTINUOUS??
S82          4   S79 AND WAVE??
S83          8   S80:S82
S84      13634   CURRENT-VOLTAGE CHARACTERISTICS
S85      45391   CURRENT VOLTAGE CHARACTERISTICS
S86       4922   CURRENT VOLTAGE
S87          9   VOLTAGE CURRENT
S88     106812   CV
S89      13949   (S1 OR LASER OR LASERS OR DIODE? ? OR IC=H01S?) AND S84:S87
S90          9   S6:S19 AND S89
S91         11   S24:S37 AND S89
S92         57   S40:S53 AND S89
S93         23   S62
S94        176   S62:S77 AND S89
S95        134   S94 AND LASER? ?
S96         18   S95 AND CW
```

```
S97          5   S95 AND INPUT???
S98         88   S90:S92 OR S96:S97
S99         62   RD S98  (unique items)
S100        61   S99 NOT (S83 OR S63)
S101         5   S42:S53 AND S100
S102         0   S63 AND S100
S103        22   THRESHOLD? AND S100
S104        25   S101:S103
S105         9   INPUT()PULSE? ? AND CW()LASER? ?
S106        24   INPUT()PULSE? ? AND CONTINUOUS??()WAVE? ?(2W)LASER? ?
S107        29   INPUT()PULSE? ? AND CW(2W)LASER? ?
S108        51   S105:S107
S109        28   RD S108  (unique items)
S110        55   S104 OR (S83 OR S63)
S111        27   S109 NOT S110
S112        11   S111 AND POWER
S113         8   S111 AND CHARACTERISTIC? ?
S114         2   S111 AND AMPLITUDE? ?
S115         4   S111 AND SEMICONDUCT??????
S116        21   S112:S115
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     CAS/STN FILE 'HCAPLUS' ENTERED AT 15:54:55 ON 28 FEB 2006
L1        32200 SEA ABB=ON  PLU=ON  CW OR C W OR CONTINUOUS(2A)WAVE
L2         1799 SEA ABB=ON  PLU=ON  INPUT######(2A)PULSE
L3         6915 SEA ABB=ON  PLU=ON  APPL########(2A)PULSE
L4          945 SEA ABB=ON  PLU=ON  INITIAL###(2A)PULSE
L5          120 SEA ABB=ON  PLU=ON  L1 AND (L2 OR L3 OR L4)
L6           30 SEA ABB=ON  PLU=ON  L2 AND L5
L7           25 SEA ABB=ON  PLU=ON  L6 AND LASER
L8            3 SEA ABB=ON  PLU=ON  L6 AND DIODE
              E SEMICONDUCTOR LASERS/CT
L9        21576 SEA ABB=ON  PLU=ON  (OSCILLATORS/CT OR LASERS/CT OR "SOLID
              STATE LASERS"/CT) AND SEMICONDUCT?
L10       25042 SEA ABB=ON  PLU=ON  ("ELECTROLUMINESCENT DEVICES"/CT OR
              "INTERCONNECTIONS, OPTICAL"/CT OR "QUANTUM BOX DEVICES"/CT OR
              "QUANTUM DOT DEVICES"/CT OR "QUANTUM WELL DEVICES"/CT) AND
              SEMICONDUCT?
L11       11886 SEA ABB=ON  PLU=ON  ("ELECTROLUMINESCENT DEVICES"/CT OR
              "INTERCONNECTIONS, OPTICAL"/CT OR "QUANTUM BOX DEVICES"/CT OR
              "QUANTUM DOT DEVICES"/CT OR "QUANTUM WELL DEVICES"/CT) AND
              LASER
L12           1 SEA ABB=ON  PLU=ON  US20040120363/PN
L13         216 SEA ABB=ON  PLU=ON  L1 AND H01S003?/IC,ECLA
L14         156 SEA ABB=ON  PLU=ON  L1 AND 372?/NCL
L15          53 SEA ABB=ON  PLU=ON  (L2 OR L3 OR L4) AND 372?/NCL
L16          78 SEA ABB=ON  PLU=ON  (L2 OR L3 OR L4) AND H01S003?/IC,ECLA
L17         120 SEA ABB=ON  PLU=ON  (L5 OR L6 OR L7 OR L8)
L18       28656 SEA ABB=ON  PLU=ON  (L9 OR L10) AND LASER
L19           2 SEA ABB=ON  PLU=ON  L13 AND L16
L20           2 SEA ABB=ON  PLU=ON  L14 AND L15
L21         469 SEA ABB=ON  PLU=ON  (L5 OR L6 OR L7 OR L8) OR (L13 OR L14 OR
              L15 OR L16 OR L17)
L22         469 SEA ABB=ON  PLU=ON  (L19 OR L20 OR L21)
L23         468 SEA ABB=ON  PLU=ON  L22 NOT L12
L24          59 SEA ABB=ON  PLU=ON  L23 AND L2
L25         383 SEA ABB=ON  PLU=ON  L23 AND L1
L26          29 SEA ABB=ON  PLU=ON  L24 AND L25
L27           7 SEA ABB=ON  PLU=ON  L26 AND (NS OR N S OR NANOSEC?)
L28           2 SEA ABB=ON  PLU=ON  L26 AND (HIGH##### OR OUTPUT#####)(3A)POWER
L29        2237 SEA ABB=ON  PLU=ON  CONTINUOUS##(6A)WAVE AND CONTINUOUS####(6A)
              ?PULS? AND WAVE(6A)?PULS?
L30        1773 SEA ABB=ON  PLU=ON  CONTINUOUS##(8A)SEMICONDUCT#######
L31       16868 SEA ABB=ON  PLU=ON  CONTINUOUS##(8A)LASER
L32        1513 SEA ABB=ON  PLU=ON  CONTINUOUS##(8A)DIODE
L33          40 SEA ABB=ON  PLU=ON  L29 AND L30
L34        1063 SEA ABB=ON  PLU=ON  L29 AND L31
L35          64 SEA ABB=ON  PLU=ON  L29 AND L32
L36           3 SEA ABB=ON  PLU=ON  L33 AND L34 AND L35
L37           0 SEA ABB=ON  PLU=ON  L7 AND NANOPULS?
L38           0 SEA ABB=ON  PLU=ON  L7 AND NANO PULS#######
L39           4 SEA ABB=ON  PLU=ON  L7 AND (SEC OR MS OR MSEC OR MU SEC OR
              SECOND OR NS OR NANO)(3A)PULS#######
L40          13 SEA ABB=ON  PLU=ON  L8 OR (L19 OR L20) OR (L27 OR L28) OR L36 OR L39
L41          12 SEA ABB=ON  PLU=ON  L40 NOT L12
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     FILE 'STNGUIDE' ENTERED AT 16:08:13 ON 28 FEB 2006

     FILE 'HCAPLUS' ENTERED AT 16:10:10 ON 28 FEB 2006
L42       43390 SEA ABB=ON  PLU=ON  ?PULS?(4A)(?DURATION? OR LASTING OR LASTS
                OR ?INTERVAL? OR ?CLOCK? OR ?TIMING? OR ?TIME?)

     FILE 'HCAPLUS' ENTERED AT 16:10:17 ON 28 FEB 2006
L43       11840 SEA ABB=ON  PLU=ON  ?PULS?(4A)RATE
L44          30 SEA ABB=ON  PLU=ON  L1 AND L2
L45          12 SEA ABB=ON  PLU=ON  (L42 OR L43) AND L44
L46           6 SEA ABB=ON  PLU=ON  L45 NOT (L40 OR L12)

     FILE 'STNGUIDE' ENTERED AT 16:10:57 ON 28 FEB 2006

     FILE 'HCAPLUS' ENTERED AT 16:12:33 ON 28 FEB 2006
L47       37690 SEA ABB=ON  PLU=ON  CONTINUOUS##(1A)(LIGHT OR LASER OR WAVE)
                OR L1
L48          50 SEA ABB=ON  PLU=ON  L47 AND INPUT####(2A)?PULS?
L49          43 SEA ABB=ON  PLU=ON  L48 AND (CURRENT OR POWER OR PROPERTY OR
                CHARACTERISTIC OR PARAMET? OR DUTY CYCLE OR WIDTH OR VOLTAGE
                OR AMPLITUDE OR PEAK OR THRESHOLD?)
L50          19 SEA ABB=ON  PLU=ON  L46 OR L41 OR L12
L51          26 SEA ABB=ON  PLU=ON  L49 NOT L50
L52          19 SEA ABB=ON  PLU=ON  L51 AND (W OR WATT###### OR VALUE OR
                COMBIN? OR OPERAT? OR MODE)
L53           5 SEA ABB=ON  PLU=ON  L51 AND (AMPLITUDE OR PEAK)
L54           2 SEA ABB=ON  PLU=ON  L51 AND MAXIM?
L55          12 SEA ABB=ON  PLU=ON  POWER AND L52
L56          14 SEA ABB=ON  PLU=ON  (L53 OR L54 OR L55)
                D ALL TOT

     FILE 'STNGUIDE' ENTERED AT 16:17:58 ON 28 FEB 2006

     FILE 'HCAPLUS' ENTERED AT 16:19:24 ON 28 FEB 2006
L57          17 SEA ABB=ON  PLU=ON  L36 OR L56
L58       69902 SEA ABB=ON  PLU=ON  CURRENT(5A)VOLTAGE
L59        1229 SEA ABB=ON  PLU=ON  (L1 OR L2 OR L3 OR L4 OR L5 OR L6 OR L7 OR
                L8 OR L9 OR L10 OR L11 OR L12 OR L13 OR L14 OR L15 OR L16 OR
                L17 OR L18 OR L19 OR L20 OR L21 OR L22 OR L23 OR L24 OR L25 OR
                L26 OR L27 OR L28 OR L29 OR L30 OR L31 OR L32 OR L33 OR L34 OR
                L35 OR L36 OR L37 OR L38 OR L39 OR L40 OR L41) AND L58
L60        1062 SEA ABB=ON  PLU=ON  (L42 OR L43 OR L44 OR L45 OR L46 OR L47 OR
                L48 OR L49 OR L50 OR L51 OR L52) AND L58
L61          33 SEA ABB=ON  PLU=ON  L56 OR L50 OR L12
L62        1977 SEA ABB=ON  PLU=ON  (L59 OR L60) NOT L61
L63         234 SEA ABB=ON  PLU=ON  L62 AND L1
L64           2 SEA ABB=ON  PLU=ON  L63 AND (L2 OR L3 OR L4)
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01mar06 09:11:49 User259284 Session D3510.2

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File 350:Derwent WPIX 1963-2006/UD,UM &UP=200614
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File 344:Chinese Patents Abs Jan 1985-2006/Jan
File 23:CSA Technology Research Database 1963-2006/Feb
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File 60:ANTE: Abstracts in New Tech & Engineer 1966-2006/Feb
File 61:Civil Engineering Abstracts. 1966-2006/Feb
File 63:Transport Res(TRIS) 1970-2006/Jan
File 64:Environmental Engineering Abstracts 1966-2006/Feb
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File 68:Solid State & Superconductivity Abstracts 1966-2006/Feb
File 81:MIRA - Motor Industry Research 2001-2006/Dec
File 94:JICST-EPlus 1985-2006/Dec W1
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File 96:FLUIDEX 1972-2006/Feb
File 99:Wilson Appl. Sci & Tech Abs 1983-2006/Jan
File 103:Energy SciTec 1974-2006/Jan B2
File 118:ICONDA-Intl Construction 1976-2006/Jan
File 134:Earthquake Engineering Abstracts 1966-2006/Feb
File 144:Pascal 1973-2006/Feb W1
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File 240:PAPERCHEM 1967-2006/Feb W3
File 248:PIRA 1975-2006/Jan W5
File 293:Engineered Materials Abstracts 1966-2006/Feb
File 315:ChemEng & Biotec Abs 1970-2005/Dec
File 323:RAPRA Rubber & Plastics 1972-2006/Jan
File 335:Ceramic Abstracts/World Ceramics Abstracts 1966-2006/Feb
File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec

Set	Items	Description
S1	461	(OPTOELECTRONIC OR OPTO()ELECTRONIC?? OR ELECTROOPTIC???? OR ELECTRO()OPTIC?? OR LASER)(W)(TIMER? ? OR TIMING OR CLOCK????)
S2	133715	IC=H01S?
S3	4800	MC=L04-A02
S4	9818	MC=L04-E03B
S5	3907	MC=U13-D04A
S6	2231	MC=U13-E04?
S7	3570	MC=V07-K02?
S8	2055	MC=V07-N01?
S9	2923	MC=V08-A02B?
S10	13151	MC=V08-A03?
S11	33830	MC=V08-A04A?
S12	16	S1 AND S2:S11
S13	54	S1 AND SEMICONDUCT?????(3N)LASER? ?
S14	67	S12 OR S13
S15	2	S14 AND CW
S16	3	S14 AND CONTINUOUS??(2N)WAVE??
S17	5	S15:S16
S18	157668	(CLOCK???? OR TIMING?? OR TIME OR TIMES OR TIMED OR TIMER?? OR JITTER????? OR SYNCHRONISATION? OR SYNCHRONIZATION? OR JITTER?????)/TI,DE,ID AND LASER??
S19	1901	S18 AND S2:S11
S20	14166	S18 AND SEMICONDUCT?????(3N)LASER? ?
S21	3805	S18 AND CW
S22	2124	S18 AND CONTINUOUS??(2N)WAVE??
S23	57091	S18 AND PULS???

S24	5504	S18 AND INPUT????
S25	13344	S18 AND OUTPUT?????
S26	6665	S18 AND (VI OR IV OR CV OR VC OR VA OR VOLT OR VOLTS OR VOLTAGE??)
S27	15637	S19:S20
S28	103	S27 AND S21:S22 AND S23 AND S24:S25
S29	10	S28 AND S26
S30	22	S28 AND (CURRENT? ? OR AMPER???????)
S31	4	29AND30
S32	4	S29 AND COMBIN????????
S33	6	S29:S30 AND AMPLITUDE? ?
S34	4	S29:S30 AND PEAK?????
S35	16	S29:S30 AND POWER
S36	10	S29:S30 AND (PS OR FS OR PICO???????? OR FEMTO??????? OR (NS OR NANOSEC?))
S37	5	35AND36
S38	9	S31:S34 OR S37
S39	26	S29:S38 AND SEMICONDUCT?????(3N)LASER? ?
S40	14	S31:S34 OR S36:S38
S41	13	39AND40
S42	14	S40:S41
S43	13	S42 NOT S17